SAFETY DATA SHEET

Agilent Technologies

QuikChange II Site-Directed Mutagenesis Kit, Part Number 200523

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

1.1 Product identifier

Product name : QuikChange II Site-Directed Mutagenesis Kit, Part Number 200523

Part no. (chemical kit) : 200523

Part no. :

PfuUltra HF DNA Polymerase	200523-51
10X Reaction Buffer	200518-58
Dpn I	200519-53
Control Primer 1 (34-mer)	200518-53
Control Primer 2 (34-mer)	200518-54
pWS4.5 Control Template	200518-55
dNTP Mix	200519-52
XL1-Blue Supercompetent Cells	200236-41
pUC 18 DNA Control Plasmid	200231-42

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

Identified uses : Analytical reagent.

PfuUltra HF DNA Polymerase	0.01 ml (25 U 2.5 U/µl)
10X Reaction Buffer	0.5 ml
Dpn I	0.01 ml (100 U 10 U/µl)
Control Primer 1 (34-mer)	0.0075 ml (750 ng 100 ng/ µl)
Control Primer 2 (34-mer)	0.0075 ml (750 ng 100 ng/ µl)
pWS4.5 Control Template	0.01 ml (50 ng 5 ng/ µl)
dNTP Mix	0.01 ml
XL1-Blue Supercompetent Cells	0.6 ml (0.2 x 3 ml)
pUC 18 DNA Control Plasmid	0.01 ml (0.1 ng / µl)

Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
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 HF DNA Polymerase	Mixture
		10X Reaction Buffer	Mixture
		Dpn I	Mixture
		Control Primer 1 (34-mer)	Mixture
		Control Primer 2 (34-mer)	Mixture
		pWS4.5 Control Template	Mixture
		dNTP Mix	Mixture
		XL1-Blue Supercompetent Cells	Mixture
		pUC 18 DNA Control Plasmid	Mixture

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

10X Reaction Buffer

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

PfuUltra HF DNA Polymerase	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
10X Reaction Buffer	The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Dpn I	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Control Primer 1 (34-mer)	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Control Primer 2 (34-mer)	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
pWS4.5 Control Template	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
dNTP Mix	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
XL1-Blue Supercompetent Cells	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
pUC 18 DNA Control Plasmid	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Ingredients of unknown toxicity	:	PfuUltra HF DNA Polymerase	Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 30 - 60%
		10X 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: 1 - 10%
		Dpn I	Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 30 - 60%
		dNTP Mix	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% Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 1 - 10%
		XL1-Blue Supercompetent Cells	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%
Ingredients of unknown ecotoxicity	:	dNTP Mix	Contains 5.7% of components with unknown hazards to the aquatic environment
		XL1-Blue Supercompetent Cells	Contains 5% of components with unknown hazards to the aquatic environment

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

SECTION 2: Hazards identification

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

2.2 Label elements

Hazard pictograms : 10X Reaction Buffer

Signal word	: PfuUltra HF DNA Polymerase	No signal word.
	10X Reaction Buffer	Warning
	Dpn I	No signal word.
	Control Primer 1 (34-mer)	No signal word.
	Control Primer 2 (34-mer)	No signal word.
	pWS4.5 Control Template	No signal word.
	dNTP Mix	No signal word.
	XL1-Blue Supercompetent Cells	No signal word.
	pUC 18 DNA Control Plasmid	No signal word.
Hazard statements	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X Reaction Buffer	H319 - Causes serious eye irritation. H412 - Harmful to aquatic life with long lasting effects.
	Dpn I	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	dNTP Mix	No known significant effects or critical hazards.
	XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

Precautionary statements

Prevention	: PfuUltra HF DNA Polymerase	Not applicable.
	10X Reaction Buffer	P280 - Wear eye or face protection. P273 - Avoid release to the environment.
	Dpn I	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	pWS4.5 Control Template	Not applicable.
	dNTP Mix	Not applicable.
	XL1-Blue Supercompetent Cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.

SECTION 2: Hazards identification

Response	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X 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.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
Storage	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
Disposal	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
Supplemental label elements	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue	Not applicable.

SECTION 2: Hazards identification

		Supercompetent Cells	
		pUC 18 DNA Control Plasmid	Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.

Special packaging requirements

Tactile warning of danger	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	:	PfuUltra HF DNA Polymerase	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		10X Reaction Buffer	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		Dpn I	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		Control Primer 1 (34-mer)	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		Control Primer 2 (34-mer)	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		pWS4.5 Control Template	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		dNTP Mix	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		XL1-Blue Supercompetent Cells	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		pUC 18 DNA Control Plasmid	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 HF DNA Polymerase	Contains one or more substances considered to have endocrine-disrupting properties.
		10X Reaction Buffer	Contains one or more substances considered to have endocrine-disrupting properties.
		Dpn I	None known.
		Control Primer 1 (34-mer)	None known.

SECTION 2: Hazards identification

Control Primer 2 (34-mer)	None known.
pWS4.5 Control Template	None known.
dNTP Mix	None known.
XL1-Blue Supercompetent Cells	None known.
pUC 18 DNA Control Plasmid	None known.

Substances identified as having endocrine disruptor properties :

Ingredient name	Impact
PfuUltra HF DNA Polymerase	
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Environment
10X Reaction Buffer	
Polyoxyethylene octyl phenyl ether	Environment

SECTION 3: Composition/information on ingredients

3.1 Substances :

PfuUltra HF DNA Polymerase	Mixture
10X Reaction Buffer	Mixture
Dpn I	Mixture
Control Primer 1 (34-mer)	Mixture
Control Primer 2 (34-mer)	Mixture
pWS4.5 Control Template	Mixture
dNTP Mix	Mixture
XL1-Blue Supercompetent Cells	Mixture
pUC 18 DNA Control Plasmid	Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
PfuUltra HF DNA Polymerase					
Glycerol	EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	-	[2]
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	CAS: 9036-19-5	<0.25	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 500 mg/kg M [Acute] = 10 M [Chronic] = 1	[1] [3]
10X Reaction Buffer					
Ammonium sulphate	EC: 231-984-1 CAS: 7783-20-2	≤3	Eye Irrit. 2, H319	-	[1]
Polyoxyethylene octyl phenyl ether	CAS: 9002-93-1	<2.5	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 1800 mg/kg M [Acute] = 10 M [Chronic] = 1	[1] [2]
Dpn I					
Glycerol	EC: 200-289-5	≥50 - ≤75	Not classified.	-	[1]

SECTION 3: Composition/information on ingredients

	CAS: 56-81-5				
XL1-Blue Supercompetent Cells					
Glycerol	EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	-	[1]
Sucrose	EC: 200-334-9 CAS: 57-50-1	≤10	Not classified. **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

PfuUltra HF DNA Polymerase	[1] Substance classified with a health or environmental hazard [2] Substance with a workplace exposure limit [3] Substance of equivalent concern
10X Reaction Buffer	[1] Substance classified with a health or environmental hazard [2] Substance of equivalent concern
Dpn I	[1] Substance with a workplace exposure limit
XL1-Blue Supercompetent Cells	[1] Substance with a workplace exposure limit

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 HF DNA Polymerase	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 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.
Dpn I	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.
Control Primer 1 (34-mer)	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.
Control Primer 2 (34-mer)	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.
pWS4.5 Control Template	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.
dNTP Mix	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.
XL1-Blue Supercompetent Cells	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.
pUC 18 DNA Control Plasmid	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.

SECTION 4: First aid measures

Inhalation	:	PfuUltra HF DNA Polymerase	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
		10X 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.
		Dpn I	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
		Control Primer 1 (34-mer)	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
		Control Primer 2 (34-mer)	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
		pWS4.5 Control Template	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
		dNTP Mix	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.
		XL1-Blue Supercompetent Cells	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
		pUC 18 DNA Control Plasmid	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Skin contact	:	PfuUltra HF DNA Polymerase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		10X 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.
		Dpn I	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		Control Primer 1 (34-mer)	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		Control Primer 2 (34-mer)	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		pWS4.5 Control Template	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		dNTP Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		XL1-Blue	Flush contaminated skin with plenty of water. Remove

SECTION 4: First aid measures

		Supercompetent Cells	contaminated clothing and shoes. Get medical attention if symptoms occur.
		pUC 18 DNA Control Plasmid	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	:	PfuUltra HF DNA Polymerase	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 Reaction Buffer	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.
		Dpn I	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.
		Control Primer 1 (34-mer)	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.
		Control Primer 2 (34-mer)	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.
		pWS4.5 Control Template	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.
		dNTP Mix	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.
		XL1-Blue Supercompetent Cells	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.
		pUC 18 DNA Control Plasmid	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.

SECTION 4: First aid measures

Protection of first-aiders	:	PfuUltra HF DNA Polymerase	No action shall be taken involving any personal risk or without suitable training.
		10X 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.
		Dpn I	No action shall be taken involving any personal risk or without suitable training.
		Control Primer 1 (34-mer)	No action shall be taken involving any personal risk or without suitable training.
		Control Primer 2 (34-mer)	No action shall be taken involving any personal risk or without suitable training.
		pWS4.5 Control Template	No action shall be taken involving any personal risk or without suitable training.
		dNTP Mix	No action shall be taken involving any personal risk or without suitable training.
		XL1-Blue Supercompetent Cells	No action shall be taken involving any personal risk or without suitable training.
		pUC 18 DNA Control Plasmid	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 HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	Causes serious eye irritation.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Inhalation	:	PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Skin contact	:	PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control	No known significant effects or critical hazards.

SECTION 4: First aid measures

		Template	
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Ingestion	:	PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	Adverse symptoms may include the following: pain or irritation watering redness
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
Inhalation	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.

SECTION 4: First aid measures

Skin contact	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
Ingestion	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	:	PfuUltra HF DNA Polymerase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		10X 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.
		Dpn I	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Control Primer 1 (34-mer)	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Control Primer 2 (34-mer)	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		pWS4.5 Control Template	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		dNTP Mix	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.
		XL1-Blue Supercompetent Cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		pUC 18 DNA Control Plasmid	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	PfuUltra HF DNA Polymerase	No specific treatment.
		10X Reaction Buffer	No specific treatment.
		Dpn I	No specific treatment.
		Control Primer 1 (34-mer)	No specific treatment.
		Control Primer 2 (34-mer)	No specific treatment.
		pWS4.5 Control Template	No specific treatment.

SECTION 4: First aid measures

dNTP Mix	No specific treatment.
XL1-Blue Supercompetent Cells	No specific treatment.
pUC 18 DNA Control Plasmid	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media :

PfuUltra HF DNA Polymerase	Use an extinguishing agent suitable for the surrounding fire.
10X Reaction Buffer	Use an extinguishing agent suitable for the surrounding fire.
Dpn I	Use an extinguishing agent suitable for the surrounding fire.
Control Primer 1 (34-mer)	Use an extinguishing agent suitable for the surrounding fire.
Control Primer 2 (34-mer)	Use an extinguishing agent suitable for the surrounding fire.
pWS4.5 Control Template	Use an extinguishing agent suitable for the surrounding fire.
dNTP Mix	Use an extinguishing agent suitable for the surrounding fire.
XL1-Blue Supercompetent Cells	Use an extinguishing agent suitable for the surrounding fire.
pUC 18 DNA Control Plasmid	Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media :

PfuUltra HF DNA Polymerase	None known.
10X Reaction Buffer	None known.
Dpn I	None known.
Control Primer 1 (34-mer)	None known.
Control Primer 2 (34-mer)	None known.
pWS4.5 Control Template	None known.
dNTP Mix	None known.
XL1-Blue Supercompetent Cells	None known.
pUC 18 DNA Control Plasmid	None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture :

PfuUltra HF DNA Polymerase	In a fire or if heated, a pressure increase will occur and the container may burst.
10X Reaction Buffer	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.
Dpn I	In a fire or if heated, a pressure increase will occur and the container may burst.
Control Primer 1 (34-mer)	In a fire or if heated, a pressure increase will occur and the container may burst.
Control Primer 2 (34-mer)	In a fire or if heated, a pressure increase will occur and the container may burst.
pWS4.5 Control Template	In a fire or if heated, a pressure increase will occur and the container may burst.
dNTP Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
XL1-Blue Supercompetent Cells	In a fire or if heated, a pressure increase will occur and the container may burst.
pUC 18 DNA Control Plasmid	In a fire or if heated, a pressure increase will occur and the container may burst.

SECTION 5: Firefighting measures

Hazardous combustion products	:	PfuUltra HF DNA Polymerase	Decomposition products may include the following materials: carbon dioxide carbon monoxide
		10X Reaction Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds
		Dpn I	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds metal oxide/oxides
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides
		XL1-Blue Supercompetent Cells	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
		pUC 18 DNA Control Plasmid	No specific data.

5.3 Advice for firefighters

Special precautions for fire-fighters	:	PfuUltra HF 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 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.
		Dpn I	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.
		Control Primer 1 (34-mer)	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.
		Control Primer 2 (34-mer)	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.
		pWS4.5 Control Template	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.
		dNTP Mix	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.
		XL1-Blue Supercompetent Cells	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.
		pUC 18 DNA Control	Promptly isolate the scene by removing all persons from the

SECTION 5: Firefighting measures

		Plasmid	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 HF 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. 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 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. 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.
		Dpn I	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.
		Control Primer 1 (34-mer)	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.
		Control Primer 2 (34-mer)	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.
		pWS4.5 Control Template	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.
		dNTP Mix	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.
		XL1-Blue Supercompetent Cells	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.
		pUC 18 DNA Control Plasmid	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 HF 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 spilt material. Put on appropriate personal protective equipment.
		10X 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. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
		Dpn I	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.
		Control Primer 1 (34-mer)	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.
		Control Primer 2 (34-mer)	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.
		pWS4.5 Control Template	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.
		dNTP Mix	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.
		XL1-Blue Supercompetent Cells	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.
		pUC 18 DNA Control Plasmid	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 HF DNA Polymerase	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 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".
		Dpn I	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".
		Control Primer 1 (34-mer)	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and

SECTION 6: Accidental release measures

		unsuitable materials. See also the information in "For non-emergency personnel".
	Control Primer 2 (34-mer)	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".
	pWS4.5 Control Template	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".
	dNTP Mix	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".
	XL1-Blue Supercompetent Cells	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".
	pUC 18 DNA Control Plasmid	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 HF DNA Polymerase	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	10X 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.
	Dpn I	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).
	Control Primer 1 (34-mer)	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).
	Control Primer 2 (34-mer)	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).
	pWS4.5 Control Template	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).
	dNTP Mix	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).
	XL1-Blue Supercompetent Cells	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).
	pUC 18 DNA Control Plasmid	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).

SECTION 6: Accidental release measures

6.3 Methods and material for containment and cleaning up

Methods for cleaning up :	PfuUltra HF DNA Polymerase	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. May be harmful to the environment if released. Dispose of spillages under controlled conditions.
	10X 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 harmful to the environment if released. Dispose of spillages under controlled conditions.
	Dpn I	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.
	Control Primer 1 (34-mer)	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.
	Control Primer 2 (34-mer)	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.
	pWS4.5 Control Template	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.
	dNTP Mix	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.
	XL1-Blue Supercompetent Cells	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.
	pUC 18 DNA Control Plasmid	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

SECTION 7: Handling and storage

Protective measures	:	PfuUltra HF DNA Polymerase	Put on appropriate personal protective equipment (see Section 8).
		10X 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.
		Dpn I	Put on appropriate personal protective equipment (see Section 8).
		Control Primer 1 (34-mer)	Put on appropriate personal protective equipment (see Section 8).
		Control Primer 2 (34-mer)	Put on appropriate personal protective equipment (see Section 8).
		pWS4.5 Control Template	Put on appropriate personal protective equipment (see Section 8).
		dNTP Mix	Put on appropriate personal protective equipment (see Section 8).
		XL1-Blue Supercompetent Cells	Put on appropriate personal protective equipment (see Section 8).
		pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	:	PfuUltra HF 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 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.
		Dpn I	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.
		Control Primer 1 (34-mer)	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.
		Control Primer 2 (34-mer)	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.
		pWS4.5 Control Template	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.
		dNTP Mix	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,

SECTION 7: Handling and storage

	drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
XL1-Blue Supercompetent Cells	Potentially biohazardous material. 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.
pUC 18 DNA Control Plasmid	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 HF DNA Polymerase	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to 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 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.
	Dpn I	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.
	Control Primer 1 (34-mer)	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.
	Control Primer 2 (34-mer)	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

SECTION 7: Handling and storage

	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.
pWS4.5 Control Template	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.
dNTP Mix	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.
XL1-Blue Supercompetent Cells	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.
pUC 18 DNA Control Plasmid	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 HF DNA Polymerase	Industrial applications, Professional applications.
		10X Reaction Buffer	Industrial applications, Professional applications.
		Dpn I	Industrial applications, Professional applications.
		Control Primer 1 (34-mer)	Industrial applications, Professional applications.
		Control Primer 2 (34-mer)	Industrial applications, Professional applications.
		pWS4.5 Control Template	Industrial applications, Professional applications.
		dNTP Mix	Industrial applications, Professional applications.
		XL1-Blue Supercompetent Cells	Industrial applications, Professional applications.
		pUC 18 DNA Control	Industrial applications, Professional applications.

SECTION 7: Handling and storage

		Plasmid	
Industrial sector specific solutions	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
PfuUltra HF DNA Polymerase	
Glycerol	**NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)** OELV-8hr: 10 mg/m³ 8 hours. Form: mist
Dpn I	
Glycerol	**NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)** OELV-8hr: 10 mg/m³ 8 hours. Form: mist
XL1-Blue Supercompetent Cells	
Glycerol	**NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)** OELV-8hr: 10 mg/m³ 8 hours. Form: mist
Sucrose	**NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)** OELV-8hr: 10 mg/m³ 8 hours. OELV-15min: 20 mg/m³ 15 minutes.

Biological exposure indices

None known.

Recommended monitoring procedures : 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 Reaction Buffer					
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 : Handle as biohazard material (Biosafety level 1). 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 HF DNA Polymerase	Liquid.
		10X Reaction Buffer	Liquid.
		Dpn I	Liquid.
		Control Primer 1 (34-mer)	Liquid.
		Control Primer 2 (34-mer)	Liquid.
		pWS4.5 Control Template	Liquid.
		dNTP Mix	Liquid.
		XL1-Blue Supercompetent Cells	Liquid.
		pUC 18 DNA Control Plasmid	Liquid.
Colour	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Odour	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Odour threshold	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.

SECTION 9: Physical and chemical properties

Melting point/freezing point	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	0°C
		Control Primer 2 (34-mer)	0°C
		pWS4.5 Control Template	0°C
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	0°C
Initial boiling point and boiling range	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	100°C
		Control Primer 2 (34-mer)	100°C
		pWS4.5 Control Template	100°C
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	100°C
Flammability	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
Upper/lower flammability or explosive limits	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Flash point	:		

SECTION 9: Physical and chemical properties

Ingredient name	Closed cup °C	Closed cup Method	Open cup °C	Open cup Method
PfuUltra HF DNA Polymerase				
Glycerol			177	
10X Reaction Buffer				
Polyoxyethylene octyl phenyl ether	251			
Dpn I				
Glycerol			177	
XL1-Blue Supercompetent Cells				
Dimethyl sulfoxide	87	ASTM D 93	87	
Glycerol			177	

Auto-ignition temperature :

Ingredient name	°C	Method
PfuUltra HF DNA Polymerase		
Glycerol	370	
Dpn I		
Glycerol	370	
XL1-Blue Supercompetent Cells		
Dimethyl sulfoxide	300 to 302	
Glycerol	370	

Decomposition temperature :

PfuUltra HF DNA Polymerase	Not available.
10X Reaction Buffer	Not available.
Dpn I	Not available.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
pWS4.5 Control Template	Not available.
dNTP Mix	Not available.
XL1-Blue Supercompetent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.

pH :

PfuUltra HF DNA Polymerase	8.2
10X Reaction Buffer	8.8
Dpn I	Not available.
Control Primer 1 (34-mer)	7.5
Control Primer 2 (34-mer)	7.5
pWS4.5 Control	7.5

SECTION 9: Physical and chemical properties

		Template	
		dNTP Mix	7.5
		XL1-Blue Supercompetent Cells	6.4
		pUC 18 DNA Control Plasmid	7.5
Viscosity	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.

Solubility(ies) :

Media	Result
PfuUltra HF DNA Polymerase	
water	Soluble
10X Reaction Buffer	
water	Soluble
Dpn I	
water	Soluble
Control Primer 1 (34-mer)	
water	Soluble
Control Primer 2 (34-mer)	
water	Soluble
pWS4.5 Control Template	
water	Soluble
dNTP Mix	
water	Soluble
XL1-Blue Supercompetent Cells	
water	Soluble
pUC 18 DNA Control Plasmid	
water	Soluble

Partition coefficient: n-octanol/water	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.

SECTION 9: Physical and chemical properties

Vapour pressure :

Ingredient name	Vapour Pressure at 20˚C			Vapour pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
PfuUltra HF DNA Polymerase						
water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
10X Reaction Buffer						
water	23.8	3.2		92.258	12.3	
Polyoxyethylene octyl phenyl ether	0.997581	0.13				
Dpn I						
water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
Control Primer 1 (34-mer)						
water	23.8	3.2		92.258	12.3	
Control Primer 2 (34-mer)						
water	23.8	3.2		92.258	12.3	
pWS4.5 Control Template						
water	23.8	3.2		92.258	12.3	
dNTP Mix						
water	23.8	3.2		92.258	12.3	
XL1-Blue Supercompetent Cells						
water	23.8	3.2		92.258	12.3	
Dimethyl sulfoxide	0.42	0.056	EU A.4			
pUC 18 DNA Control Plasmid						
water	23.8	3.2		92.258	12.3	

SECTION 9: Physical and chemical properties

Evaporation rate	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Relative density	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Vapour density	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Explosive properties	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.

SECTION 9: Physical and chemical properties

Oxidising properties	:	PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		dNTP Mix	Not available.
		XL1-Blue Supercompetent Cells	Not available.
		pUC 18 DNA Control Plasmid	Not available.
Particle characteristics			
Median particle size	:	PfuUltra HF DNA Polymerase	Not applicable.
		10X Reaction Buffer	Not applicable.
		Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.
		Control Primer 2 (34-mer)	Not applicable.
		pWS4.5 Control Template	Not applicable.
		dNTP Mix	Not applicable.
		XL1-Blue Supercompetent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	:	PfuUltra HF DNA Polymerase	No specific test data related to reactivity available for this product or its ingredients.
		10X Reaction Buffer	No specific test data related to reactivity available for this product or its ingredients.
		Dpn I	No specific test data related to reactivity available for this product or its ingredients.
		Control Primer 1 (34-mer)	No specific test data related to reactivity available for this product or its ingredients.
		Control Primer 2 (34-mer)	No specific test data related to reactivity available for this product or its ingredients.
		pWS4.5 Control Template	No specific test data related to reactivity available for this product or its ingredients.
		dNTP Mix	No specific test data related to reactivity available for this product or its ingredients.
		XL1-Blue Supercompetent Cells	No specific test data related to reactivity available for this product or its ingredients.
		pUC 18 DNA Control Plasmid	No specific test data related to reactivity available for this product or its ingredients.

SECTION 10: Stability and reactivity

10.2 Chemical stability	:	PfuUltra HF DNA Polymerase	The product is stable.
		10X Reaction Buffer	The product is stable.
		Dpn I	The product is stable.
		Control Primer 1 (34-mer)	The product is stable.
		Control Primer 2 (34-mer)	The product is stable.
		pWS4.5 Control Template	The product is stable.
		dNTP Mix	The product is stable.
		XL1-Blue Supercompetent Cells	The product is stable.
		pUC 18 DNA Control Plasmid	The product is stable.
10.3 Possibility of hazardous reactions	:	PfuUltra HF DNA Polymerase	Under normal conditions of storage and use, hazardous reactions will not occur.
		10X Reaction Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
		Dpn I	Under normal conditions of storage and use, hazardous reactions will not occur.
		Control Primer 1 (34-mer)	Under normal conditions of storage and use, hazardous reactions will not occur.
		Control Primer 2 (34-mer)	Under normal conditions of storage and use, hazardous reactions will not occur.
		pWS4.5 Control Template	Under normal conditions of storage and use, hazardous reactions will not occur.
		dNTP Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
		XL1-Blue Supercompetent Cells	Under normal conditions of storage and use, hazardous reactions will not occur.
		pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
10.5 Incompatible materials	:	PfuUltra HF DNA Polymerase	May react or be incompatible with oxidising materials.
		10X Reaction Buffer	May react or be incompatible with oxidising materials.
		Dpn I	May react or be incompatible with oxidising materials.
		Control Primer 1 (34-mer)	May react or be incompatible with oxidising materials.
		Control Primer 2 (34-mer)	May react or be incompatible with oxidising materials.
		pWS4.5 Control Template	May react or be incompatible with oxidising materials.
		dNTP Mix	May react or be incompatible with oxidising materials.

SECTION 10: Stability and reactivity

	XL1-Blue Supercompetent Cells	May react or be incompatible with oxidising materials.
	pUC 18 DNA Control Plasmid	May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products :	PfuUltra HF DNA Polymerase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	10X Reaction Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Dpn I	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Control Primer 1 (34-mer)	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Control Primer 2 (34-mer)	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	pWS4.5 Control Template	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	dNTP Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	XL1-Blue Supercompetent Cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	pUC 18 DNA Control Plasmid	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 HF DNA Polymerase				
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	LD50 Oral	Rat	2800 mg/kg	-
10X Reaction Buffer				
Ammonium sulphate	LD50 Oral	Rat	2840 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 HF DNA Polymerase					
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	500	N/A	N/A	N/A	N/A
10X Reaction Buffer					
10X Reaction Buffer	180000.0	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
XL1-Blue Supercompetent Cells					
XL1-Blue Supercompetent Cells	31250	N/A	N/A	N/A	N/A

Irritation/Corrosion

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
PfuUltra HF DNA Polymerase Poly(oxy-1,2-ethanediyl), . alpha.-[(1,1,3,3-tetramethylbutyl) phenyl]-.omega.-hydroxy-	Eyes - Severe irritant	Rabbit	-	1 %	-
10X Reaction Buffer Polyoxyethylene octyl phenyl ether	Skin - Mild irritant	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

Not available.

Information on likely routes of exposure :

PfuUltra HF DNA Polymerase	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
10X Reaction Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
Dpn I	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
pWS4.5 Control Template	Not available.
dNTP Mix	Not available.
XL1-Blue Supercompetent Cells	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
pUC 18 DNA Control Plasmid	Not available.

Potential acute health effects

Inhalation :

PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
10X Reaction Buffer	No known significant effects or critical hazards.
Dpn I	No known significant effects or critical hazards.
Control Primer 1 (34-mer)	No known significant effects or critical hazards.
Control Primer 2 (34-mer)	No known significant effects or critical hazards.
pWS4.5 Control Template	No known significant effects or critical hazards.
dNTP Mix	No known significant effects or critical hazards.
XL1-Blue	No known significant effects or critical hazards.

SECTION 11: Toxicological information

		Supercompetent Cells	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Ingestion	:	PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Skin contact	:	PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Eye contact	:	PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	Causes serious eye irritation.
		Dpn I	No known significant effects or critical hazards.
		Control Primer 1 (34-mer)	No known significant effects or critical hazards.
		Control Primer 2 (34-mer)	No known significant effects or critical hazards.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue	No specific data.

SECTION 11: Toxicological information

		Supercompetent Cells	
		pUC 18 DNA Control Plasmid	No specific data.
Ingestion	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
Skin contact	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
Eye contact	:	PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	Adverse symptoms may include the following: pain or irritation watering redness
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		dNTP Mix	No specific data.
		XL1-Blue Supercompetent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

SECTION 11: Toxicological information

Potential delayed effects : Not available.

Potential chronic health effects

General	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X Reaction Buffer	No known significant effects or critical hazards.
	Dpn I	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	dNTP Mix	No known significant effects or critical hazards.
	XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Carcinogenicity	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X Reaction Buffer	No known significant effects or critical hazards.
	Dpn I	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	dNTP Mix	No known significant effects or critical hazards.
	XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Mutagenicity	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X Reaction Buffer	No known significant effects or critical hazards.
	Dpn I	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	dNTP Mix	No known significant effects or critical hazards.
	XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Reproductive toxicity	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X Reaction Buffer	No known significant effects or critical hazards.
	Dpn I	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	dNTP Mix	No known significant effects or critical hazards.
	XL1-Blue Supercompetent Cells	No known significant effects or critical hazards.

SECTION 11: Toxicological information

pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
PfuUltra HF DNA Polymerase			
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Acute EC50 210 µg/l Fresh water	Algae - Selenastrum sp.	96 hours
	Acute LC50 10800 µg/l Marine water	Crustaceans - Pandalus montagui - Adult	48 hours
	Acute LC50 8600 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 7200 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
10X Reaction Buffer			
Ammonium sulphate	Chronic NOEC 7.5 mg/l Marine water	Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours
Polyoxyethylene octyl phenyl ether	Acute LC50 5.85 mg/l Fresh water	Crustaceans - Ceriodaphnia rigaudi - Neonate	48 hours
	Acute LC50 11.2 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 4500 µg/l Fresh water	Fish - Pimephales promelas	96 hours

12.2 Persistence and degradability

Not available.

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

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
PfuUltra HF DNA Polymerase			
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	2.7	78.67	low
10X Reaction Buffer			
Ammonium sulphate	-5.1	-	low
Polyoxyethylene octyl phenyl ether	4.86	-	high

SECTION 12: Ecological information

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 Endocrine disrupting properties

PfuUltra HF DNA Polymerase	Contains one or more substances considered to have endocrine-disrupting properties.
10X Reaction Buffer	Contains one or more substances considered to have endocrine-disrupting properties.

12.7 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 : Dispose of material(s) and residues under controlled conditions. 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 or ID number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-

SECTION 14: Transport information

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

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
PfuUltra HF DNA Polymerase Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Endocrine disrupting properties for environment	Listed	42	7/3/2017
10X Reaction Buffer Polyoxyethylene octyl phenyl ether	Endocrine disrupting properties for environment	Listed	42	7/3/2017

Substances of very high concern

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
PfuUltra HF DNA Polymerase Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Endocrine disrupting properties for environment	Recommended	ED/169/2012	7/3/2017
10X Reaction Buffer Polyoxyethylene octyl phenyl ether	Endocrine disrupting properties for environment	Recommended	ED/169/2012	7/3/2017

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

Ingredient name	CAS no.	Status
10X Reaction Buffer Ammonium sulphate	7783-20-2	65

Label :

PfuUltra HF DNA Polymerase	Not applicable.
10X Reaction Buffer	Not applicable.
Dpn I	Not applicable.
Control Primer 1 (34-mer)	Not applicable.
Control Primer 2 (34-mer)	Not applicable.
pWS4.5 Control Template	Not applicable.
dNTP Mix	Not applicable.
XL1-Blue Supercompetent Cells	Not applicable.

SECTION 15: Regulatory information

pUC 18 DNA Control Plasmid 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	:	All components are listed or exempted.
China	:	Not determined.
Eurasian Economic Union	:	**Russian Federation inventory**: 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.
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.

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

Full text of abbreviated H statements

PfuUltra HF DNA Polymerase	
H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
10X 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 [CLP/GHS]

PfuUltra HF DNA Polymerase	
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
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
10X 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

Date of issue/ Date of revision : 16/12/2022

Date of previous issue : No previous validation

Version : 1

Notice to reader

SECTION 16: Other information

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