

SAFETY DATA SHEET



QuikChange Lightning Site-Directed Mutagenesis Kit, Part Number 210519

Section 1. Identification

1.1 Product identifier

Product name	: QuikChange Lightning Site-Directed Mutagenesis Kit, Part Number 210519	
Part no. (chemical kit)	: 210519	
Part no.	: QuikSolution	200516-51
	QuikChange Lightning Enzyme	210519-51
	10X QuikChange Lightning Buffer	210518-53
	QuikChange XL dNTP Mix	200516-52
	Dpn I Enzyme	210519-52
	pWS4.5 Control Template	200518-55
	Control Primer 1 (34-mer)	200518-53
	Control Primer 2 (34-mer)	200518-54
	XL10-Gold Ultracompetent cells	200315-41
	XL10-Gold 2-Mercaptoethanol	200314-43
	pUC 18 DNA Control Plasmid	200231-42

Validation date : 1/6/2022

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

Material uses	: Analytical reagent.	
	QuikSolution	0.5 ml
	QuikChange Lightning Enzyme	0.03 ml (30 reactions)
	10X QuikChange Lightning Buffer	0.500 ml
	QuikChange XL dNTP Mix	0.03 ml
	Dpn I Enzyme	0.06 ml (30 reactions)
	pWS4.5 Control Template	0.01 ml (50 ng 5 ng/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)
	XL10-Gold Ultracompetent cells	1.35 ml
	XL10-Gold 2-Mercaptoethanol	2 x 0.05 ml
	pUC 18 DNA Control Plasmid	0.01 ml (0.1 ng/μl)

1.3 Details of the supplier of the safety data sheet

Supplier/Manufacturer : Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

1.4 Emergency telephone number

In case of emergency : CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status	: QuikSolution	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
	QuikChange Lightning Enzyme	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
	10X QuikChange Lightning Buffer	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Section 2. Hazards identification

QuikChange XL dNTP Mix	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Dpn I Enzyme	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
pWS4.5 Control Template	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Control Primer 1 (34-mer)	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Control Primer 2 (34-mer)	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
XL10-Gold Ultracompetent cells	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
XL10-Gold	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
2-Mercaptoethanol	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
pUC 18 DNA Control Plasmid	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture

QuikSolution

H227 FLAMMABLE LIQUIDS - Category 4
H320 EYE IRRITATION - Category 2B

QuikChange Lightning Enzyme

H320 EYE IRRITATION - Category 2B

Dpn I Enzyme

H319 EYE IRRITATION - Category 2A

XL10-Gold Ultracompetent cells

H320 EYE IRRITATION - Category 2B

XL10-Gold 2-Mercaptoethanol

H318 SERIOUS EYE DAMAGE - Category 1
H317 SKIN SENSITIZATION - Category 1
H361 TOXIC TO REPRODUCTION - Category 2
H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
H412 AQUATIC HAZARD (LONG-TERM) - Category 3

Section 2. Hazards identification

10X QuikChange Lightning Buffer	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 2%
QuikChange XL dNTP Mix	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5.7%
XL10-Gold Ultracompetent cells	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5%

2.2 GHS label elements

Hazard pictograms

: Dpn I Enzyme



XL10-Gold 2-Mercaptoethanol



Signal word

: QuikSolution	Warning
QuikChange Lightning Enzyme	Warning
10X QuikChange Lightning Buffer	No signal word.
QuikChange XL dNTP Mix	No signal word.
Dpn I Enzyme	Warning
pWS4.5 Control Template	No signal word.
Control Primer 1 (34-mer)	No signal word.
Control Primer 2 (34-mer)	No signal word.
XL10-Gold Ultracompetent cells	Warning
XL10-Gold 2-Mercaptoethanol	Danger
pUC 18 DNA Control Plasmid	No signal word.


Hazard statements

: QuikSolution	H227 - Combustible liquid. H320 - Causes eye irritation.
QuikChange Lightning Enzyme	H320 - Causes eye irritation.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	H319 - Causes serious eye irritation.
pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	H320 - Causes eye irritation.
XL10-Gold 2-Mercaptoethanol	H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H361 - Suspected of damaging fertility or the unborn child. H373 - May cause damage to organs through prolonged or repeated exposure. (heart, liver)
pUC 18 DNA Control Plasmid	H412 - Harmful to aquatic life with long lasting effects. No known significant effects or critical hazards.

Precautionary statements

Section 2. Hazards identification


Prevention

:  QuikSolution

QuikChange Lightning Enzyme
 10X QuikChange Lightning Buffer
 QuikChange XL dNTP Mix
 Dpn I Enzyme
 pWS4.5 Control Template
 Control Primer 1 (34-mer)
 Control Primer 2 (34-mer)
 XL10-Gold Ultracompetent cells
 XL10-Gold 2-Mercaptoethanol

P210 - Keep away from flames and hot surfaces.
 No smoking.
 Not applicable.
 Not applicable.
 Not applicable.
 P280 - Wear eye or face protection.
 Not applicable.
 Not applicable.
 Not applicable.
 Not applicable.
 Not applicable.
 P201 - Obtain special instructions before use.
 P280 - Wear protective gloves, protective clothing and eye or face protection.
 P273 - Avoid release to the environment.
 P260 - Do not breathe vapor.

Response

:  QuikSolution

pUC 18 DNA Control Plasmid

QuikChange Lightning Enzyme

10X QuikChange Lightning Buffer
 QuikChange XL dNTP Mix
 Dpn I Enzyme

pWS4.5 Control Template
 Control Primer 1 (34-mer)
 Control Primer 2 (34-mer)
 XL10-Gold Ultracompetent cells

XL10-Gold 2-Mercaptoethanol

pUC 18 DNA Control Plasmid

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.
 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.
 Not applicable.
 Not applicable.
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 - If eye irritation persists: Get medical advice or attention.
 Not applicable.
 Not applicable.
 Not applicable.
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 - If eye irritation persists: Get medical advice or attention.
 P308 + P313 - IF exposed or concerned: Get medical advice or attention.
 P363 - Wash contaminated clothing before reuse.
 P302 + P352 - IF ON SKIN: Wash with plenty of water.
 P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.
 P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
 Not applicable.

Section 2. Hazards identification

Storage	: QuikSolution	P403 + P235 - Store in a well-ventilated place. Keep cool.
	QuikChange Lightning Enzyme	Not applicable.
	10X QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
Disposal	: QuikSolution	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	QuikChange Lightning Enzyme	Not applicable.
	10X QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	pUC 18 DNA Control Plasmid	Not applicable.
Supplemental label elements	: QuikSolution	None known.
	QuikChange Lightning Enzyme	None known.
	10X QuikChange Lightning Buffer	None known.
	QuikChange XL dNTP Mix	None known.
	Dpn I Enzyme	None known.
	pWS4.5 Control Template	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2 (34-mer)	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold 2-Mercaptoethanol	None known.
	pUC 18 DNA Control Plasmid	None known.
2.3 Other hazards		
Hazards not otherwise classified	: QuikSolution	None known.
	QuikChange Lightning Enzyme	None known.
	10X QuikChange Lightning Buffer	None known.
	QuikChange XL dNTP Mix	None known.
	Dpn I Enzyme	None known.
	pWS4.5 Control Template	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2 (34-mer)	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold 2-Mercaptoethanol	None known.
	pUC 18 DNA Control Plasmid	None known.

Section 3. Composition/information on ingredients

Substance/mixture	:	QuikSolution	Substance
		QuikChange Lightning Enzyme	Mixture
		10X QuikChange Lightning Buffer	Mixture
		QuikChange XL dNTP Mix	Mixture
		Dpn I Enzyme	Mixture
		pWS4.5 Control Template	Mixture
		Control Primer 1 (34-mer)	Mixture
		Control Primer 2 (34-mer)	Mixture
		XL10-Gold Ultracompetent cells	Mixture
		XL10-Gold 2-Mercaptoethanol	Mixture
		pUC 18 DNA Control Plasmid	Mixture

Ingredient name	%	CAS number
QuikSolution Dimethyl sulfoxide	100	67-68-5
QuikChange Lightning Enzyme Glycerol	≥50 - ≤75	56-81-5
10X QuikChange Lightning Buffer Potassium chloride	≤4.7	7447-40-7
Dodecyldimethyl(3-sulphonatopropyl)ammonium	≤3	14933-08-5
Ammonium sulphate	≤2	7783-20-2
Dpn I Enzyme Glycerol	≥50 - ≤75	56-81-5
Sodium chloride	≤3	7647-14-5
XL10-Gold Ultracompetent cells Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
XL10-Gold 2-Mercaptoethanol Sodium chloride	≥10 - ≤25	7647-14-5
2-Mercaptoethanol	≤5	60-24-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

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

Section 4. First aid measures

4.1 Description of necessary first aid measures

Eye contact	:	QuikSolution	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
		QuikChange Lightning Enzyme	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
		10X QuikChange Lightning Buffer	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get

Section 4. First aid measures

QuikChange XL dNTP Mix	medical attention if irritation occurs. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Dpn I Enzyme	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.
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.
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.
XL10-Gold Ultracompetent cells	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. 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. Chemical burns must be treated promptly by a physician.
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.
Inhalation	
: QuikSolution	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.
QuikChange Lightning Enzyme	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

Section 4. First aid measures

	an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
10X QuikChange Lightning Buffer	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.
QuikChange XL 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.
Dpn I Enzyme	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.
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.
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.
XL10-Gold Ultracompetent cells	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.
XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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. If

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Skin contact

		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.
	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.
	: QuikSolution	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.
	QuikChange Lightning Enzyme	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	10X QuikChange Lightning Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	QuikChange XL dNTP Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Dpn I Enzyme	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.
	pWS4.5 Control Template	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.
	XL10-Gold Ultracompetent cells	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.
	XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	pUC 18 DNA Control Plasmid	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Section 4. First aid measures

Ingestion

: QuikSolution

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.

QuikChange Lightning Enzyme

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

10X QuikChange Lightning Buffer

Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

QuikChange XL 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.

Dpn I Enzyme

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.

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.

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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.
XL10-Gold Ultracompetent cells	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.
XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. 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. Chemical burns must be treated promptly by a physician. 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.
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.

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact

: QuikSolution	Causes eye irritation.
QuikChange Lightning Enzyme	Causes eye irritation.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	Causes serious eye irritation.
pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	Causes eye irritation.
XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.

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	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Inhalation	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	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.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Skin contact	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	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.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	May cause an allergic skin reaction.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Ingestion	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	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.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	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	: QuikSolution	Adverse symptoms may include the following: irritation watering redness
	QuikChange Lightning Enzyme	Adverse symptoms may include the following: irritation watering redness
	10X QuikChange Lightning Buffer	No specific data.
	QuikChange XL dNTP Mix	No specific data.
	Dpn I Enzyme	Adverse symptoms may include the following: pain or irritation watering redness
	pWS4.5 Control Template	No specific data.
	Control Primer 1 (34-mer)	No specific data.
	Control Primer 2 (34-mer)	No specific data.
	XL10-Gold Ultracompetent cells	Adverse symptoms may include the following: irritation watering redness
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain

Section 4. First aid measures

fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

QuikChange XL 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.

Dpn I Enzyme
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.

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.

XL10-Gold Ultracompetent cells
Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

XL10-Gold 2-Mercaptoethanol
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

- : QuikSolution No specific treatment.
- : QuikChange Lightning Enzyme No specific treatment.
- : 10X QuikChange Lightning Buffer No specific treatment.
- : QuikChange XL dNTP Mix No specific treatment.
- : Dpn I Enzyme No specific treatment.
- : pWS4.5 Control Template No specific treatment.
- : Control Primer 1 (34-mer) No specific treatment.
- : Control Primer 2 (34-mer) No specific treatment.
- : XL10-Gold Ultracompetent cells No specific treatment.
- : XL10-Gold 2-Mercaptoethanol No specific treatment.
- : pUC 18 DNA Control Plasmid No specific treatment.

Protection of first-aiders

- : QuikSolution 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.
- : QuikChange Lightning Enzyme No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- : 10X QuikChange Lightning Buffer No action shall be taken involving any personal risk or without suitable training.
- : QuikChange XL dNTP Mix No action shall be taken involving any personal risk or without suitable training.
- : Dpn I Enzyme 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.
- : pWS4.5 Control Template 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

Section 4. First aid measures

XL10-Gold Ultracompetent cells	or without suitable training. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media	: QuikSolution	Use dry chemical, CO ₂ , water spray (fog) or foam.
	QuikChange Lightning Enzyme	Use an extinguishing agent suitable for the surrounding fire.
	10X QuikChange Lightning Buffer	Use an extinguishing agent suitable for the surrounding fire.
	QuikChange XL dNTP Mix	Use an extinguishing agent suitable for the surrounding fire.
	Dpn I Enzyme	Use an extinguishing agent suitable for the surrounding fire.
	pWS4.5 Control Template	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.
	XL10-Gold Ultracompetent cells	Use an extinguishing agent suitable for the surrounding fire.
	XL10-Gold 2-Mercaptoethanol	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	: QuikSolution	Do not use water jet.
	QuikChange Lightning Enzyme	None known.
	10X QuikChange Lightning Buffer	None known.
	QuikChange XL dNTP Mix	None known.
	Dpn I Enzyme	None known.
	pWS4.5 Control Template	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2 (34-mer)	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold 2-Mercaptoethanol	None known.
pUC 18 DNA Control Plasmid	None known.	

5.2 Special hazards arising from the substance or mixture

Section 5. Fire-fighting measures

Specific hazards arising from the chemical	: QuikSolution	Combustible liquid. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.
	QuikChange Lightning Enzyme	In a fire or if heated, a pressure increase will occur and the container may burst.
	10X QuikChange Lightning Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
	QuikChange XL dNTP Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
	Dpn I Enzyme	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.
	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.
	XL10-Gold Ultracompetent cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	XL10-Gold 2-Mercaptoethanol	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.
	pUC 18 DNA Control Plasmid	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	: QuikSolution	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
	QuikChange Lightning Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	10X QuikChange Lightning Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds metal oxide/oxides
	QuikChange XL dNTP Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides
	Dpn I Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds

Section 5. Fire-fighting measures

pWS4.5 Control Template	metal oxide/oxides
Control Primer 1 (34-mer)	No specific data.
Control Primer 2 (34-mer)	No specific data.
XL10-Gold Ultracompetent cells	No specific data.
	Decomposition products may include the following materials:
	carbon dioxide
	carbon monoxide
	sulfur oxides
	halogenated compounds
	metal oxide/oxides
XL10-Gold 2-Mercaptoethanol	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 protective actions for fire-fighters

: QuikSolution	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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
QuikChange Lightning Enzyme	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 QuikChange Lightning 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.
QuikChange XL 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.
Dpn I Enzyme	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.
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.
XL10-Gold Ultracompetent 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.

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters

XL10-Gold 2-Mercaptoethanol	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 Plasmid	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.
QuikSolution	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
QuikChange Lightning Enzyme	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
10X QuikChange Lightning Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
QuikChange XL 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.
Dpn I Enzyme	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
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.
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.
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.
XL10-Gold Ultracompetent cells	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
XL10-Gold 2-Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
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.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: QuikSolution

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

QuikChange Lightning Enzyme

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

10X QuikChange Lightning Buffer

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

QuikChange XL 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 spilled material. Put on appropriate personal protective equipment.

Dpn I Enzyme

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

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 spilled 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 spilled 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 spilled material. Put on appropriate personal protective equipment.

Section 6. Accidental release measures

XL10-Gold Ultracompetent 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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 spilled material. Put on appropriate personal protective equipment.
For emergency responders : QuikSolution	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
QuikChange Lightning Enzyme	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
10X QuikChange Lightning Buffer	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
QuikChange XL dNTP Mix	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Dpn I Enzyme	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
pWS4.5 Control Template	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Control Primer 1 (34-mer)	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Control Primer 2 (34-mer)	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
XL10-Gold Ultracompetent cells	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

pUC 18 DNA Control Plasmid	large quantities. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
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6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : QuikSolution

QuikChange Lightning Enzyme	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
10X QuikChange Lightning Buffer	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
QuikChange XL 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.
Dpn I Enzyme	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.
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.
XL10-Gold Ultracompetent cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble.

Section 6. Accidental release measures

XL10-Gold 2-Mercaptoethanol	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.
	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

7.1 Precautions for safe handling

Protective measures : QuikSolution

QuikChange Lightning Enzyme	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.
10X QuikChange Lightning Buffer	Put on appropriate personal protective equipment (see Section 8).
QuikChange XL dNTP Mix	Put on appropriate personal protective equipment (see Section 8).
Dpn I Enzyme	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
pWS4.5 Control Template	Put on appropriate personal protective equipment (see Section 8).
Control Primer 1 (34-mer)	Put on appropriate personal protective equipment (see Section 8).

Section 7. Handling and storage

	Control Primer 2 (34-mer)	Put on appropriate personal protective equipment (see Section 8).
	XL10-Gold Ultracompetent cells	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	XL10-Gold 2-Mercaptoethanol	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. 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.
	pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
<p>Advice on general occupational hygiene</p>	: QuikSolution	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.
	QuikChange Lightning Enzyme	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 QuikChange Lightning 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.
	QuikChange XL 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, 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 Enzyme	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face

Section 7. Handling and storage

pWS4.5 Control Template	before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
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.
XL10-Gold Ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	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

: QuikSolution

Store in accordance with local regulations. Store in a segregated and approved area. 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. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 7. Handling and storage

QuikChange Lightning Enzyme	<p>See Section 10 for incompatible materials before handling or use.</p> <p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
10X QuikChange Lightning Buffer	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
QuikChange XL dNTP Mix	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
Dpn I Enzyme	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
pWS4.5 Control Template	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
Control Primer 1 (34-mer)	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from</p>

Section 7. Handling and storage

Control Primer 2 (34-mer)	incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
XL10-Gold Ultracompetent 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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
XL10-Gold 2-Mercaptoethanol	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. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

[7.3 Specific end use\(s\)](#)

Section 7. Handling and storage

Recommendations	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications.
Industrial sector specific solutions	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
QuikSolution Dimethyl sulfoxide	OARS WEEL (United States, 1/2021). TWA: 250 ppm 8 hours.
QuikChange Lightning Enzyme Glycerol	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 10 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 5/2018). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust
10X QuikChange Lightning Buffer Potassium chloride Dodecyldimethyl(3-sulphonatopropyl)ammonium Ammonium sulphate	None. None. None.
Dpn I Enzyme Glycerol	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 10 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 5/2018). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust
Sodium chloride	None.

Section 8. Exposure controls/personal protection

<p>XL10-Gold Ultracompetent cells Glycerol</p> <p>Dimethyl sulfoxide</p> <p>Potassium chloride</p> <p>XL10-Gold 2-Mercaptoethanol Sodium chloride 2-Mercaptoethanol</p>	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 10 mg/m³ 8 hours. Form: Total dust</p> <p>OSHA PEL (United States, 5/2018). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>OARS WEEL (United States, 1/2021). TWA: 250 ppm 8 hours. None.</p> <p>None. OARS WEEL (United States, 1/2021). Absorbed through skin. TWA: 0.2 ppm 8 hours.</p>
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8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : 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. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

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

Section 9. Physical and chemical properties and safety characteristics

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

Appearance

Physical state	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Liquid. [Clear.] Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid.
Color	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Colorless. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
Odor	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Slight [Slight] Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
Odor threshold	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
pH	:		

Section 9. Physical and chemical properties and safety characteristics

QuikSolution	Not available.
QuikChange Lightning Enzyme	8.2
10X QuikChange Lightning Buffer	8.8
QuikChange XL dNTP Mix	7.5
Dpn I Enzyme	7.5
pWS4.5 Control Template	7.5
Control Primer 1 (34-mer)	7.5
Control Primer 2 (34-mer)	7.5
XL10-Gold Ultracompetent cells	6.4
XL10-Gold 2-Mercaptoethanol	Not available.
pUC 18 DNA Control Plasmid	7.5

Melting point/freezing point :

QuikSolution	18.4°C (65.1°F)
QuikChange Lightning Enzyme	Not available.
10X QuikChange Lightning Buffer	Not available.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Not available.
pWS4.5 Control Template	0°C (32°F)
Control Primer 1 (34-mer)	0°C (32°F)
Control Primer 2 (34-mer)	0°C (32°F)
XL10-Gold Ultracompetent cells	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.
pUC 18 DNA Control Plasmid	0°C (32°F)

Boiling point, initial boiling point, and boiling range :

QuikSolution	188.8°C (371.8°F)
QuikChange Lightning Enzyme	Not available.
10X QuikChange Lightning Buffer	Not available.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Not available.
pWS4.5 Control Template	100°C (212°F)
Control Primer 1 (34-mer)	100°C (212°F)
Control Primer 2 (34-mer)	100°C (212°F)
XL10-Gold Ultracompetent cells	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.
pUC 18 DNA Control Plasmid	100°C (212°F)

Flash point :

QuikSolution	Closed cup: 85°C (185°F) [ASTM D 93] Open cup: 87°C (188.6°F)
QuikChange Lightning Enzyme	Not available.
10X QuikChange Lightning Buffer	Not available.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Not available.
pWS4.5 Control Template	Not available.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
XL10-Gold Ultracompetent cells	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.
pUC 18 DNA Control Plasmid	Not available.

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
QuikChange Lightning Enzyme						
Edetic acid	>100	>212	DIN 51758			
(R*,R*) -1,4-Dimercaptobutane- 2,3-diol	>110	>230				
Dpn I Enzyme						
Edetic acid	>100	>212	DIN 51758			

Section 9. Physical and chemical properties and safety characteristics

(R*,R*) -1,4-Dimercaptobutane- 2,3-diol	>110	>230			
pWS4.5 Control Template					
Edetic acid	>100	>212	DIN 51758		
Control Primer 1 (34-mer)					
Edetic acid	>100	>212	DIN 51758		
Control Primer 2 (34-mer)					
Edetic acid	>100	>212	DIN 51758		
XL10-Gold Ultracompetent cells					
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6
Glycerol			Pensky-Martens	177	350.6
XL10-Gold 2-Mercaptoethanol					
2-Mercaptoethanol	74	165.2		74	165.2
pUC 18 DNA Control Plasmid					
Edetic acid	>100	>212	DIN 51758		

Evaporation rate

- : QuikSolution 0.026 (butyl acetate = 1)
- QuikChange Lightning Enzyme Not available.
- 10X QuikChange Lightning Buffer Not available.
- QuikChange XL dNTP Mix Not available.
- Dpn I Enzyme Not available.
- pWS4.5 Control Template Not available.
- Control Primer 1 (34-mer) Not available.
- Control Primer 2 (34-mer) Not available.
- XL10-Gold Ultracompetent cells Not available.
- XL10-Gold 2-Mercaptoethanol Not available.
- pUC 18 DNA Control Plasmid Not available.

Flammability

- : QuikSolution Not applicable.
- QuikChange Lightning Enzyme Not applicable.
- 10X QuikChange Lightning Buffer Not applicable.
- QuikChange XL dNTP Mix Not applicable.
- Dpn I Enzyme Not applicable.
- pWS4.5 Control Template Not applicable.
- Control Primer 1 (34-mer) Not applicable.
- Control Primer 2 (34-mer) Not applicable.
- XL10-Gold Ultracompetent cells Not applicable.
- XL10-Gold 2-Mercaptoethanol Not applicable.
- pUC 18 DNA Control Plasmid Not applicable.

Section 9. Physical and chemical properties and safety characteristics

Lower and upper explosion limit/flammability limit	QuikSolution	Lower: 2.6%	
		Upper: 42%	
	QuikChange Lightning Enzyme	Not available.	
	10X QuikChange Lightning Buffer	Not available.	
	QuikChange XL dNTP Mix	Not available.	
	Dpn I Enzyme	Not available.	
	pWS4.5 Control Template	Not available.	
	Control Primer 1 (34-mer)	Not available.	
	Control Primer 2 (34-mer)	Not available.	
	XL10-Gold Ultracompetent cells	Not available.	
	XL10-Gold 2-Mercaptoethanol	Not available.	
	pUC 18 DNA Control Plasmid	Not available.	
	Vapor pressure	<input checked="" type="checkbox"/> QuikSolution	0.056 kPa (0.42 mm Hg) [EU A.4]
		QuikChange Lightning Enzyme	Not available.
		10X QuikChange Lightning Buffer	Not available.
QuikChange XL dNTP Mix		Not available.	
Dpn I Enzyme		Not available.	
pWS4.5 Control Template		Not available.	
Control Primer 1 (34-mer)		Not available.	
Control Primer 2 (34-mer)		Not available.	
XL10-Gold Ultracompetent cells		Not available.	
XL10-Gold 2-Mercaptoethanol		Not available.	
pUC 18 DNA Control Plasmid		Not available.	

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
<input checked="" type="checkbox"/> QuikChange Lightning Enzyme						
Water	23.8	3.2		92.258	12.3	
Glycerol	0	0		0	0	
10X QuikChange Lightning Buffer						
Water	23.8	3.2		92.258	12.3	
Sulfuric acid, magnesium salt, hydrate (1:1:7)	<0.1	<0.013				
QuikChange XL dNTP Mix						
Water	23.8	3.2		92.258	12.3	
Dpn I Enzyme						
Water	23.8	3.2		92.258	12.3	
Glycerol	0	0		0	0	
pWS4.5 Control Template						
Water	23.8	3.2		92.258	12.3	
Edetic acid	0	0				
Control Primer 1 (34-mer)						

Section 9. Physical and chemical properties and safety characteristics

Water	23.8	3.2		92.258	12.3
Edetic acid	0	0			
Control Primer 2 (34-mer)					
Water	23.8	3.2		92.258	12.3
Edetic acid	0	0			
XL10-Gold Ultracompetent cells					
Water	23.8	3.2		92.258	12.3
Dimethyl sulfoxide	0.42	0.056	EU A.4		
XL10-Gold 2-Mercaptoethanol					
Water	23.8	3.2		92.258	12.3
2-Mercaptoethanol	0.98	0.13			
pUC 18 DNA Control Plasmid					
Water	23.8	3.2		92.258	12.3
2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	0	0		0.000007501	0.000001

Relative vapor density : QuikSolution 2.71 [Air = 1]
 QuikChange Lightning Enzyme Not available.
 10X QuikChange Lightning Buffer Not available.
 QuikChange XL dNTP Mix Not available.
 Dpn I Enzyme Not available.
 pWS4.5 Control Template Not available.
 Control Primer 1 (34-mer) Not available.
 Control Primer 2 (34-mer) Not available.
 XL10-Gold Ultracompetent cells Not available.
 XL10-Gold 2-Mercaptoethanol Not available.
 pUC 18 DNA Control Plasmid Not available.

Relative density : QuikSolution 1.1
 QuikChange Lightning Enzyme Not available.
 10X QuikChange Lightning Buffer Not available.
 QuikChange XL dNTP Mix Not available.
 Dpn I Enzyme Not available.
 pWS4.5 Control Template Not available.
 Control Primer 1 (34-mer) Not available.
 Control Primer 2 (34-mer) Not available.
 XL10-Gold Ultracompetent cells Not available.
 XL10-Gold 2-Mercaptoethanol Not available.
 pUC 18 DNA Control Plasmid Not available.

Solubility : QuikSolution Easily soluble in the following materials: cold water and hot water.
 QuikChange Lightning Enzyme Easily soluble in the following materials: cold water and hot water.
 10X QuikChange Lightning Buffer Easily soluble in the following materials: cold water and hot water.
 QuikChange XL dNTP Mix Easily soluble in the following materials: cold water and hot water.

Section 9. Physical and chemical properties and safety characteristics

Dpn I Enzyme	Soluble in the following materials: cold water and hot water.
pWS4.5 Control Template	Easily soluble in the following materials: cold water and hot water.
Control Primer 1 (34-mer)	Easily soluble in the following materials: cold water and hot water.
Control Primer 2 (34-mer)	Easily soluble in the following materials: cold water and hot water.
XL10-Gold Ultracompetent cells	Soluble in the following materials: cold water and hot water.
XL10-Gold 2-Mercaptoethanol	Easily soluble in the following materials: cold water and hot water.
pUC 18 DNA Control Plasmid	Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water

QuikSolution	-2.029
QuikChange Lightning Enzyme	Not applicable.
10X QuikChange Lightning Buffer	Not applicable.
QuikChange XL dNTP Mix	Not applicable.
Dpn I Enzyme	Not applicable.
pWS4.5 Control Template	Not applicable.
Control Primer 1 (34-mer)	Not applicable.
Control Primer 2 (34-mer)	Not applicable.
XL10-Gold Ultracompetent cells	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.

Auto-ignition temperature

QuikSolution	300 to 302°C (572 to 575.6°F)
QuikChange Lightning Enzyme	Not available.
10X QuikChange Lightning Buffer	Not available.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Not available.
pWS4.5 Control Template	Not available.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
XL10-Gold Ultracompetent cells	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.
pUC 18 DNA Control Plasmid	Not available.

Ingredient name	°C	°F	Method
QuikChange Lightning Enzyme			
Glycerol	370	698	
Edetic acid	>400	>752	VDI 2263
Dpn I Enzyme			
Glycerol	370	698	
Edetic acid	>400	>752	VDI 2263
pWS4.5 Control Template			
Edetic acid	>400	>752	VDI 2263
Control Primer 1 (34-mer)			
Edetic acid	>400	>752	VDI 2263
Control Primer 2 (34-mer)			
Edetic acid	>400	>752	VDI 2263

Section 9. Physical and chemical properties and safety characteristics

XL10-Gold Ultracompetent cells			
Dimethyl sulfoxide	300 to 302	572 to 575.6	
Glycerol	370	698	
XL10-Gold 2-Mercaptoethanol			
2-Mercaptoethanol	295	563	
pUC 18 DNA Control Plasmid			
Edetic acid	>400	>752	VDI 2263

Decomposition temperature : QuikSolution 140 to 189°C (284 to 372.2°F)
 QuikChange Lightning Enzyme Not available.
 10X QuikChange Lightning Buffer Not available.
 QuikChange XL dNTP Mix Not available.
 Dpn I Enzyme Not available.
 pWS4.5 Control Template Not available.
 Control Primer 1 (34-mer) Not available.
 Control Primer 2 (34-mer) Not available.
 XL10-Gold Ultracompetent cells Not available.
 XL10-Gold 2-Mercaptoethanol Not available.
 pUC 18 DNA Control Plasmid Not available.

Viscosity : QuikSolution Dynamic: 2.14 mPa·s (2.14 cP)
 QuikChange Lightning Enzyme Not available.
 10X QuikChange Lightning Buffer Not available.
 QuikChange XL dNTP Mix Not available.
 Dpn I Enzyme Not available.
 pWS4.5 Control Template Not available.
 Control Primer 1 (34-mer) Not available.
 Control Primer 2 (34-mer) Not available.
 XL10-Gold Ultracompetent cells Not available.
 XL10-Gold 2-Mercaptoethanol Not available.
 pUC 18 DNA Control Plasmid Not available.

Particle characteristics

Median particle size : QuikSolution Not applicable.
 QuikChange Lightning Enzyme Not applicable.
 10X QuikChange Lightning Buffer Not applicable.
 QuikChange XL dNTP Mix Not applicable.
 Dpn I Enzyme Not applicable.
 pWS4.5 Control Template Not applicable.
 Control Primer 1 (34-mer) Not applicable.
 Control Primer 2 (34-mer) Not applicable.
 XL10-Gold Ultracompetent cells Not applicable.
 XL10-Gold 2-Mercaptoethanol Not applicable.
 pUC 18 DNA Control Plasmid Not applicable.

Section 10. Stability and reactivity

10.1 Reactivity : QuikSolution No specific test data related to reactivity available for this product or its ingredients.
 QuikChange Lightning Enzyme No specific test data related to reactivity available for this product or its ingredients.
 10X QuikChange Lightning Buffer No specific test data related to reactivity available for this product or its ingredients.
 QuikChange XL dNTP Mix No specific test data related to reactivity available for this product or its ingredients.
 Dpn I Enzyme No specific test data related to reactivity available for this product or its ingredients.

Section 10. Stability and reactivity

pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	No specific test data related to reactivity available for this product or its ingredients.
XL10-Gold 2-Mercaptoethanol	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.

10.2 Chemical stability

: QuikSolution	The product is stable.
QuikChange Lightning Enzyme	The product is stable.
10X QuikChange Lightning Buffer	The product is stable.
QuikChange XL dNTP Mix	The product is stable.
Dpn I Enzyme	The product is stable.
pWS4.5 Control Template	The product is stable.
Control Primer 1 (34-mer)	The product is stable.
Control Primer 2 (34-mer)	The product is stable.
XL10-Gold Ultracompetent cells	The product is stable.
XL10-Gold 2-Mercaptoethanol	The product is stable.
pUC 18 DNA Control Plasmid	The product is stable.

10.3 Possibility of hazardous reactions

: QuikSolution	Under normal conditions of storage and use, hazardous reactions will not occur.
QuikChange Lightning Enzyme	Under normal conditions of storage and use, hazardous reactions will not occur.
10X QuikChange Lightning Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
QuikChange XL dNTP Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
Dpn I Enzyme	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.
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.
XL10-Gold Ultracompetent cells	Under normal conditions of storage and use, hazardous reactions will not occur.
XL10-Gold 2-Mercaptoethanol	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

: QuikSolution	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
QuikChange Lightning Enzyme	No specific data.
10X QuikChange Lightning Buffer	No specific data.
QuikChange XL dNTP Mix	No specific data.
Dpn I Enzyme	No specific data.
pWS4.5 Control Template	No specific data.
Control Primer 1 (34-mer)	No specific data.

Section 10. Stability and reactivity

Control Primer 2 (34-mer)	No specific data.
XL10-Gold Ultracompetent cells	No specific data.
XL10-Gold 2-Mercaptoethanol	No specific data.
pUC 18 DNA Control Plasmid	No specific data.

10.5 Incompatible materials	: QuikSolution	Reactive or incompatible with the following materials: oxidizing materials
	QuikChange Lightning Enzyme	May react or be incompatible with oxidizing materials.
	10X QuikChange Lightning Buffer	May react or be incompatible with oxidizing materials.
	QuikChange XL dNTP Mix	May react or be incompatible with oxidizing materials.
	Dpn I Enzyme	May react or be incompatible with oxidizing materials.
	pWS4.5 Control Template	May react or be incompatible with oxidizing materials.
	Control Primer 1 (34-mer)	May react or be incompatible with oxidizing materials.
	Control Primer 2 (34-mer)	May react or be incompatible with oxidizing materials.
	XL10-Gold Ultracompetent cells	May react or be incompatible with oxidizing materials.
	XL10-Gold 2-Mercaptoethanol	May react or be incompatible with oxidizing materials.
	pUC 18 DNA Control Plasmid	May react or be incompatible with oxidizing materials.

10.6 Hazardous decomposition products	: QuikSolution	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	QuikChange Lightning Enzyme	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	10X QuikChange Lightning Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	QuikChange XL dNTP Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Dpn I Enzyme	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.
	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.
	XL10-Gold Ultracompetent cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	XL10-Gold 2-Mercaptoethanol	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,

Section 10. Stability and reactivity

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
QuikSolution Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
QuikChange Lightning Enzyme Glycerol	LD50 Oral	Rat	12600 mg/kg	-
10X QuikChange Lightning Buffer Potassium chloride Ammonium sulphate	LD50 Oral LD50 Oral	Rat Rat	2600 mg/kg 2840 mg/kg	- -
Dpn I Enzyme Glycerol Sodium chloride	LD50 Oral LD50 Oral	Rat Rat	12600 mg/kg 3000 mg/kg	- -
XL10-Gold Ultracompetent cells Glycerol Dimethyl sulfoxide Potassium chloride	LD50 Oral LD50 Dermal LD50 Oral LD50 Oral	Rat Rat Rat Rat	12600 mg/kg 40000 mg/kg 14500 mg/kg 2600 mg/kg	- - - -
XL10-Gold 2-Mercaptoethanol Sodium chloride 2-Mercaptoethanol	LD50 Oral LD50 Oral	Rat Rat	3000 mg/kg 244 mg/kg	- -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
QuikSolution Dimethyl sulfoxide	Eyes - Mild irritant Eyes - Mild irritant Skin - Mild irritant Skin - Mild irritant	Rabbit Rabbit Rabbit Rabbit	- - - -	24 hours 500 mg 100 mg 24 hours 500 mg 100 mg	- - - -
QuikChange Lightning Enzyme Glycerol	Eyes - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	24 hours 500 mg 24 hours 500 mg	- -
10X QuikChange Lightning Buffer Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-

Section 11. Toxicological information

Dpn I Enzyme Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Eyes - Moderate irritant Skin - Mild irritant	Rabbit Rabbit	- -	10 mg 24 hours 500 mg	- -
XL10-Gold Ultracompetent cells Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500 mg	- -
Potassium chloride	Skin - Mild irritant Eyes - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500 mg	- -
	XL10-Gold 2-Mercaptoethanol Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg
Eyes - Moderate irritant Skin - Mild irritant		Rabbit Rabbit	- -	10 mg 24 hours 500 mg	- -
2-Mercaptoethanol		Rabbit	-	2 mg	-

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
10X QuikChange Lightning Buffer Dodecyldimethyl(3-sulphonatopropyl)ammonium	Category 3	-	Respiratory tract irritation
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	Category 3	-	Respiratory tract irritation

Section 11. Toxicological information

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	Category 2	oral	heart, liver

Aspiration hazard

Not available.

Information on the likely routes of exposure

QuikSolution	Routes of entry anticipated: Oral, Dermal, Inhalation.
QuikChange Lightning Enzyme	Routes of entry anticipated: Oral, Dermal, Inhalation.
10X QuikChange Lightning Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Routes of entry anticipated: Oral, Dermal, Inhalation.
pWS4.5 Control Template	Not available.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
XL10-Gold Ultracompetent cells	Routes of entry anticipated: Oral, Dermal, Inhalation.
XL10-Gold 2-Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation.
pUC 18 DNA Control Plasmid	Not available.

Potential acute health effects

Eye contact

QuikSolution	Causes eye irritation.
QuikChange Lightning Enzyme	Causes eye irritation.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	Causes serious eye irritation.
pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	Causes eye irritation.
XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

Inhalation

QuikSolution	No known significant effects or critical hazards.
QuikChange Lightning Enzyme	No known significant effects or critical hazards.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	No known significant effects or critical hazards.
pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

Skin contact

QuikSolution	No known significant effects or critical hazards.
QuikChange Lightning Enzyme	No known significant effects or critical hazards.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	No known significant effects or critical hazards.
pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.

Section 11. Toxicological information

Ingestion	XL10-Gold 2-Mercaptoethanol	May cause an allergic skin reaction.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	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.
XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.	
XL10-Gold 2-Mercaptoethanol	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

Eye contact	: QuikSolution	Adverse symptoms may include the following: irritation watering redness
	QuikChange Lightning Enzyme	Adverse symptoms may include the following: irritation watering redness
	10X QuikChange Lightning Buffer	No specific data.
	QuikChange XL dNTP Mix	No specific data.
	Dpn I Enzyme	Adverse symptoms may include the following: pain or irritation watering redness
	pWS4.5 Control Template	No specific data.
	Control Primer 1 (34-mer)	No specific data.
	Control Primer 2 (34-mer)	No specific data.
	XL10-Gold Ultracompetent cells	Adverse symptoms may include the following: irritation watering redness
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness
Inhalation	pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Enzyme	No specific data.
	10X QuikChange Lightning Buffer	No specific data.
	QuikChange XL dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	pWS4.5 Control Template	No specific data.
	Control Primer 1 (34-mer)	No specific data.
	Control Primer 2 (34-mer)	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations	
pUC 18 DNA Control Plasmid	No specific data.	

Section 11. Toxicological information

Carcinogenicity	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Mutagenicity	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Reproductive toxicity	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. Suspected of damaging fertility or the unborn child. No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
QuikSolution Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
QuikChange Lightning Enzyme Glycerol	12600	N/A	N/A	N/A	N/A
10X QuikChange Lightning Buffer 10X QuikChange Lightning Buffer	17820.3	55000	N/A	550	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
Dodecyldimethyl(3-sulphonatopropyl)ammonium	500	1100	N/A	11	N/A
Ammonium sulphate	2840	N/A	N/A	N/A	N/A
Dpn I Enzyme Dpn I Enzyme	131045.2	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Sodium chloride	3000	N/A	N/A	N/A	N/A
XL10-Gold Ultracompetent cells					

Section 11. Toxicological information

XL10-Gold Ultracompetent cells	136842.1	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
XL10-Gold 2-Mercaptoethanol					
XL10-Gold 2-Mercaptoethanol	4615.5	4545.5	N/A	60.7	N/A
Sodium chloride	3000	N/A	N/A	N/A	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A

Section 12. Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
QuikSolution Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 ul/L Marine water Chronic NOEC 100 ul/L Fresh water	Daphnia - Daphnia magna - Neonate Fish - Pimephales promelas Algae - Ulva lactuca Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 96 hours 72 hours 21 days
QuikChange Lightning Enzyme Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
10X QuikChange Lightning Buffer Potassium chloride	Acute EC50 1337000 µg/l Fresh water Acute EC50 9.24 g/L Fresh water Acute EC50 83000 µg/l Fresh water Acute LC50 9.68 mg/l Fresh water	Algae - Navicula seminulum Algae - Desmodesmus subspicatus Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate	96 hours 72 hours 48 hours 48 hours
Ammonium sulphate	Acute LC50 509.65 mg/l Fresh water Chronic NOEC 7.5 mg/l Marine water	Fish - Danio rerio Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours 96 hours
Dpn I Enzyme Glycerol Sodium chloride	Acute LC50 54000 mg/l Fresh water Acute EC50 2430000 µg/l Fresh water Acute EC50 519.6 mg/l Fresh water Acute EC50 402.6 mg/l Fresh water Acute IC50 6.87 g/L Fresh water Acute LC50 1000000 µg/l Fresh water Chronic LC10 781 mg/l Fresh water Chronic NOEC 6 g/L Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Fish - Oncorhynchus mykiss Algae - Navicula seminulum Crustaceans - Cypris subglobosa Daphnia - Daphnia magna Aquatic plants - Lemna minor Fish - Morone saxatilis - Larvae Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling) Aquatic plants - Lemna minor Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	96 hours 96 hours 48 hours 48 hours 96 hours 96 hours 3 weeks 96 hours 21 days 8 weeks
XL10-Gold Ultracompetent cells			

Section 12. Ecological information

Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 100 ul/L Marine water	Algae - Ulva lactuca	72 hours
	Chronic NOEC 100 ul/L Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days
Potassium chloride	Acute EC50 1337000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 9.24 g/L Fresh water	Algae - Desmodesmus subspicatus	72 hours
	Acute EC50 83000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 9.68 mg/l Fresh water	Crustaceans - Pseudosida ramosa - Neonate	48 hours
	Acute LC50 509.65 mg/l Fresh water	Fish - Danio rerio	96 hours
XL10-Gold			
2-Mercaptoethanol			
Sodium chloride	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute EC50 402.6 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
QuikSolution Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
QuikChange Lightning Enzyme Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dpn I Enzyme Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
XL10-Gold Ultracompetent cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-

Section 12. Ecological information

Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO ₂ in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
QuikSolution Dimethyl sulfoxide	-	-	Not readily
10X QuikChange Lightning Buffer Potassium chloride Ammonium sulphate	- -	- -	Readily Readily
XL10-Gold Ultracompetent cells Dimethyl sulfoxide Potassium chloride	- -	- -	Not readily Readily
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
QuikSolution Dimethyl sulfoxide	-2.029	3.16	low
QuikChange Lightning Enzyme Glycerol	-1.76	-	low
10X QuikChange Lightning Buffer Potassium chloride Ammonium sulphate	-0.46 -5.1	- -	low low
Dpn I Enzyme Glycerol	-1.76	-	low
XL10-Gold Ultracompetent cells Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	low low low
XL10-Gold			

Section 12. Ecological information

2-Mercaptoethanol			
2-Mercaptoethanol	-0.056	-	low

12.4 Mobility in soil

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

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

Section 13. Disposal considerations

13.1 Waste treatment methods

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT / TDG / Mexico / IMDG / IATA : Not regulated.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
Clean Water Act (CWA) 311: Edetic acid

Section 15. Regulatory information

Clean Air Act Section 112 : Listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification

QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B EYE IRRITATION - Category 2B Not applicable. Not applicable. EYE IRRITATION - Category 2A Not applicable. Not applicable. Not applicable. EYE IRRITATION - Category 2B SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2 Not applicable.
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Composition/information on ingredients

Name	%	Classification
QuikSolution Dimethyl sulfoxide	100	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B
QuikChange Lightning Enzyme Glycerol	≥50 - ≤75	EYE IRRITATION - Category 2B
10X QuikChange Lightning Buffer Potassium chloride	≤4.7	EYE IRRITATION - Category 2B
Dodecyldimethyl (3-sulphonatopropyl)ammonium	≤3	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
Ammonium sulphate	≤2	EYE IRRITATION - Category 2A
Dpn I Enzyme Glycerol	≥50 - ≤75	EYE IRRITATION - Category 2B
Sodium chloride	≤3	EYE IRRITATION - Category 2A
XL10-Gold Ultracompetent cells		EYE IRRITATION - Category 2B

Section 15. Regulatory information

Glycerol	≥10 - ≤25	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B COMBUSTIBLE DUSTS EYE IRRITATION - Category 2B
Dimethyl sulfoxide	≤10	
Sucrose	≤10	
Potassium chloride	≤3	
XL10-Gold 2-Mercaptoethanol		
Sodium chloride	≥10 - ≤25	EYE IRRITATION - Category 2A FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 3 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1A TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
2-Mercaptoethanol	≤5	

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	10X QuikChange Lightning Buffer Ammonium sulphate	7783-20-2	≤2
Supplier notification	10X QuikChange Lightning Buffer Ammonium sulphate	7783-20-2	≤2

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

- Massachusetts** : The following components are listed: GLYCERINE MIST
- New York** : None of the components are listed.
- New Jersey** : The following components are listed: GLYCERIN; 1,2,3-PROPANETRIOL; DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-
- Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

- Australia** : Not determined.
- Canada** : Not determined.
- China** : Not determined.

Section 15. Regulatory information

Europe	: Not determined.
Japan	: Japan inventory (CSCL): Not determined. Japan inventory (ISHL): Not determined.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: Not determined.
Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
United States	: Not determined.
Viet Nam	: Not determined.

Section 16. Other information

Procedure used to derive the classification

Classification	Justification
QuikSolution FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B	On basis of test data On basis of test data
QuikChange Lightning Enzyme EYE IRRITATION - Category 2B	Calculation method
Dpn I Enzyme EYE IRRITATION - Category 2A	Calculation method
XL10-Gold Ultracompetent cells EYE IRRITATION - Category 2B	Calculation method
XL10-Gold 2-Mercaptoethanol SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method Calculation method Calculation method Calculation method Calculation method

History

Date of issue	: 01/06/2022
Date of previous issue	: 04/28/2021
Version	: 6.1

Key to abbreviations

: ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 N/A = Not available
 UN = United Nations

Indicates information that has changed from previously issued version.

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.