

# SAFETY DATA SHEET



QuikChange Lightning Multi Site-Directed Mutagenesis Kit, Part Number 210515

## Section 1. Identification

### 1.1 Product identifier

**Product name** : QuikChange Lightning Multi Site-Directed Mutagenesis Kit, Part Number 210515  
**Part No. (Chemical Kit)** : 210515  
**Part No.** :  QuikSolution 200516-51  
 QuikChange Lightning Multi Enzyme 210515-51  
 10X QuikChange Lightning Multi Buffer 210513-52  
 dNTP Mix 200519-52  
 Dpn I Enzyme 210518-52  
 QuikChange Multi Control Template 200514-53  
 QuikChange Multi Ctl. Primer Mix 200514-54  
 XL10-Gold Ultracompetent cells 200315-41  
 XL10-Gold 2-Mercaptoethanol 200314-43  
 pUC 18 DNA Control Plasmid 200231-42

**Validation date** : 10/19/2016

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

**Material uses** :  Analytical reagent.  
 QuikSolution 0.5 mL  
 QuikChange Lightning Multi Enzyme 0.01 mL (10 reactions)  
 10X QuikChange Lightning Multi Buffer 0.2 mL  
 dNTP Mix 0.01 mL  
 Dpn I Enzyme 0.01 mL (10 reactions)  
 QuikChange Multi Control Template 0.005 mL (250 ng 50 ng/μl)  
 QuikChange Multi Ctl. Primer Mix 0.005 mL (100 ng/μl ea.)  
 XL10-Gold Ultracompetent cells 0.54 mL  
 XL10-Gold 2-Mercaptoethanol 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 Multi Enzyme This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 10X QuikChange Lightning Multi Buffer This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 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

## Section 2. Hazards identification

Dpn I Enzyme	SDS should be retained and available for employees and other users of this product.
QuikChange Multi Control Template	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). 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.
QuikChange Multi Ctl. Primer 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.
XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). 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 Multi Enzyme

H320 EYE IRRITATION - Category 2B

#### 10X QuikChange Lightning Multi Buffer

H319 EYE IRRITATION - Category 2A

#### 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

**Ingredients of unknown toxicity** :  dNTP Mix  
Percentage of the mixture consisting of ingredient (s) of unknown toxicity: 5.7%

### 2.2 GHS label elements

#### Hazard pictograms



## Section 2. Hazards identification

<b>Signal word</b>	<input checked="" type="checkbox"/> QuikSolution	Warning
	QuikChange Lightning Multi Enzyme	Warning
	10X QuikChange Lightning Multi Buffer	Warning
	dNTP Mix	No signal word.
	Dpn I Enzyme	Warning
	QuikChange Multi Control Template	No signal word.
	QuikChange Multi Ctl. Primer Mix	No signal word.
	XL10-Gold Ultracompetent cells	Warning
	XL10-Gold 2-Mercaptoethanol	Danger
	pUC 18 DNA Control Plasmid	No signal word.
<b>Hazard statements</b>	<input checked="" type="checkbox"/> QuikSolution	H227 - Combustible liquid. H320 - Causes eye irritation. H320 - Causes eye irritation.
	QuikChange Lightning Multi Enzyme	
	10X QuikChange Lightning Multi Buffer	GHS SYMBOL - <b>Exclamation mark</b> -  H319 - Causes serious eye irritation.
	dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	GHS SYMBOL - <b>Exclamation mark</b> - H319 - Causes serious eye irritation.
	QuikChange Multi Control Template	No known significant effects or critical hazards.
	QuikChange Multi Ctl. Primer Mix	No known significant effects or critical hazards.
	XL10-Gold Ultracompetent cells	H320 - Causes eye irritation.
	XL10-Gold 2-Mercaptoethanol	GHS SYMBOL - <b>Corrosion</b> - <b>Exclamation mark</b> - H318 - Causes serious eye damage. H317 - May cause an allergic skin reaction.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
<b>Precautionary statements</b>	<input checked="" type="checkbox"/> QuikSolution	P280 - Wear protective gloves. Wear eye or face protection. P210 - Keep away from flames and hot surfaces. - No smoking. P264 - Wash hands thoroughly after handling. P264 - Wash hands thoroughly after handling.
	QuikChange Lightning Multi Enzyme	
	10X QuikChange Lightning Multi Buffer	P280 - Wear eye or face protection.
	dNTP Mix	P264 - Wash hands thoroughly after handling.
	Dpn I Enzyme	Not applicable. P280 - Wear eye or face protection. P264 - Wash hands thoroughly after handling.
	QuikChange Multi Control Template	Not applicable.
	QuikChange Multi Ctl. Primer Mix	Not applicable.
	XL10-Gold Ultracompetent cells	P264 - Wash hands thoroughly after handling.
	XL10-Gold 2-Mercaptoethanol	P280 - Wear protective gloves. Wear eye or face protection. P261 - Avoid breathing vapor. P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.
	pUC 18 DNA Control Plasmid	Not applicable.
<b>Prevention</b>	<input checked="" type="checkbox"/> QuikSolution	P280 - Wear protective gloves. Wear eye or face protection. P210 - Keep away from flames and hot surfaces. - No smoking. P264 - Wash hands thoroughly after handling. P264 - Wash hands thoroughly after handling.
	QuikChange Lightning Multi Enzyme	
	10X QuikChange Lightning Multi Buffer	P280 - Wear eye or face protection.
	dNTP Mix	P264 - Wash hands thoroughly after handling.
	Dpn I Enzyme	Not applicable. P280 - Wear eye or face protection. P264 - Wash hands thoroughly after handling.
	QuikChange Multi Control Template	Not applicable.
	QuikChange Multi Ctl. Primer Mix	Not applicable.
	XL10-Gold Ultracompetent cells	P264 - Wash hands thoroughly after handling.
	XL10-Gold 2-Mercaptoethanol	P280 - Wear protective gloves. Wear eye or face protection. P261 - Avoid breathing vapor. P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.
	pUC 18 DNA Control Plasmid	Not applicable.

## Section 2. Hazards identification

### Response

:  QuikSolution

QuikChange Lightning Multi Enzyme

10X QuikChange Lightning Multi Buffer

dNTP Mix  
Dpn I Enzyme

QuikChange Multi Control Template  
QuikChange Multi Ctl. Primer Mix  
XL10-Gold Ultracompetent cells

XL10-Gold 2-Mercaptoethanol

pUC 18 DNA Control Plasmid

### Storage

:  QuikSolution

QuikChange Lightning Multi Enzyme

10X QuikChange Lightning Multi Buffer

dNTP Mix  
Dpn I Enzyme

QuikChange Multi Control Template

QuikChange Multi Ctl. Primer Mix  
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 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 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 attention.

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 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 attention.

P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse.

P333 + P313 - If skin irritation or rash occurs: Get medical 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 physician.

Not applicable.

P403 - Store in a well-ventilated place.

P235 - Keep cool.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

## Section 2. Hazards identification

<b>Disposal</b>	: <input checked="" type="checkbox"/> QuikSolution	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	QuikChange Lightning Multi Enzyme	Not applicable.
	10X QuikChange Lightning Multi Buffer	Not applicable.
	dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	QuikChange Multi Control Template	Not applicable.
	QuikChange Multi Ctl. Primer Mix	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.
<b>Supplemental label elements</b>	: <input checked="" type="checkbox"/> QuikSolution	None known.
	QuikChange Lightning Multi Enzyme	None known.
	10X QuikChange Lightning Multi Buffer	None known.
	dNTP Mix	None known.
	Dpn I Enzyme	None known.
	QuikChange Multi Control Template	None known.
	QuikChange Multi Ctl. Primer Mix	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold 2-Mercaptoethanol	None known.
	pUC 18 DNA Control Plasmid	None known.
<b>2.3 Other hazards</b>		
<b>Hazards not otherwise classified</b>	: <input checked="" type="checkbox"/> QuikSolution	None known.
	QuikChange Lightning Multi Enzyme	None known.
	10X QuikChange Lightning Multi Buffer	None known.
	dNTP Mix	None known.
	Dpn I Enzyme	None known.
	QuikChange Multi Control Template	None known.
	QuikChange Multi Ctl. Primer Mix	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

<b>Substance/mixture</b>	: <input checked="" type="checkbox"/> QuikSolution	Substance
	QuikChange Lightning Multi Enzyme	Mixture
	10X QuikChange Lightning Multi Buffer	Mixture
	dNTP Mix	Mixture
	Dpn I Enzyme	Mixture
	QuikChange Multi Control Template	Mixture
	QuikChange Multi Ctl. Primer Mix	Mixture
	XL10-Gold Ultracompetent cells	Mixture
	XL10-Gold 2-Mercaptoethanol	Mixture
	pUC 18 DNA Control Plasmid	Mixture

## Section 3. Composition/information on ingredients

Ingredient name	%	CAS number
<b>QuikSolution</b> Dimethyl sulfoxide	100	67-68-5
<b>QuikChange Lightning Multi Enzyme</b> Glycerol	≥50 - ≤75	56-81-5
<b>10X QuikChange Lightning Multi Buffer</b> Potassium chloride	≤5	7447-40-7
2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	≤5	1185-53-1
Ammonium sulphate	≤3	7783-20-2
Polyoxyethylene octyl phenyl ether	≤2.3	9002-93-1
<b>dNTP Mix</b> 2'-Deoxyguanosine 5'-(tetrahydrogen triphosphate)	≤3	2564-35-4
2'-Deoxyadenosine 5'-(tetrahydrogen triphosphate)	≤3	1927-31-7
<b>Dpn I Enzyme</b> Glycerol	≥50 - ≤75	56-81-5
Sodium chloride	≤3	7647-14-5
<b>XL10-Gold Ultracompetent cells</b> Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
<b>XL10-Gold 2-Mercaptoethanol</b> 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 as hazardous to health or the environment and hence require reporting in this section.**

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

## Section 4. First aid measures

### 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 Multi 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 Multi Buffer

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

dNTP Mix

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

Dpn I Enzyme		medical attention if irritation occurs. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
QuikChange Multi 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.
QuikChange Multi Ctl. Primer Mix		Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
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.
<b>Inhalation</b>	 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 Multi 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.
10X QuikChange Lightning Multi Buffer		Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be

## Section 4. First aid measures

	dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
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.
QuikChange Multi Control Template	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
QuikChange Multi Ctl. Primer Mix	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



## Section 4. First aid measures

### Skin contact

: QuikSolution

pUC 18 DNA Control Plasmid

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.

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

QuikChange Lightning Multi 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.

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 Multi Buffer

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

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.

QuikChange Multi Control Template

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

QuikChange Multi Ctl. Primer Mix

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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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 Multi Enzyme

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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 Multi Buffer

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.

dNTP Mix

Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is

## Section 4. First aid measures

	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 Multi Control Template	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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 Multi Ctl. Primer Mix	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.

## Section 4. First aid measures

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Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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

<b>Eye contact</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li> <li>XL10-Gold Ultracompetent cells</li> <li>XL10-Gold 2-Mercaptoethanol</li> <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>Causes eye irritation.</li> <li>Causes eye irritation.</li> <li>Causes serious eye irritation.</li> <li>No known significant effects or critical hazards.</li> <li>Causes serious eye irritation.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>Causes eye irritation.</li> <li>Causes serious eye damage.</li> <li>No known significant effects or critical hazards.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li> <li>XL10-Gold Ultracompetent cells</li> <li>XL10-Gold 2-Mercaptoethanol</li> <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> </ul>
<b>Skin contact</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li> <li>XL10-Gold Ultracompetent cells</li> <li>XL10-Gold 2-Mercaptoethanol</li> <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control</li> </ul>	<ul style="list-style-type: none"> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> </ul>

## Section 4. First aid measures

	Template	No known significant effects or critical hazards.	
	QuikChange Multi Ctl. Primer Mix	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.	
<b>Over-exposure signs/symptoms</b>			
<b>Eye contact</b>	: <input checked="" type="checkbox"/> QuikSolution	Adverse symptoms may include the following: irritation watering redness	
	QuikChange Lightning Multi Enzyme	Adverse symptoms may include the following:  irritation watering redness	
	10X QuikChange Lightning Multi Buffer	Adverse symptoms may include the following:  pain or irritation watering redness	
	dNTP Mix Dpn I Enzyme	No specific data. Adverse symptoms may include the following: pain or irritation watering redness	
	QuikChange Multi Control Template	No specific data.	
	QuikChange Multi Ctl. Primer Mix XL10-Gold Ultracompetent cells	No specific data. Adverse symptoms may include the following: irritation watering redness	
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness	
	pUC 18 DNA Control Plasmid	No specific data.	
	<b>Inhalation</b>	: <input checked="" type="checkbox"/> QuikSolution	No specific data.
		QuikChange Lightning Multi Enzyme	No specific data.
10X QuikChange Lightning Multi Buffer		No specific data.	
dNTP Mix		No specific data.	
Dpn I Enzyme		No specific data.	
QuikChange Multi Control Template		No specific data.	
QuikChange Multi Ctl. Primer Mix		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.	
<b>Skin contact</b>	: <input checked="" type="checkbox"/> QuikSolution	No specific data.	
	QuikChange Lightning Multi Enzyme	No specific data.	
	10X QuikChange Lightning Multi Buffer	No specific data.	
	dNTP Mix	No specific data.	
	Dpn I Enzyme	No specific data.	
	QuikChange Multi Control	No specific data.	



## Section 4. First aid measures

	Template	
	QuikChange Multi Ctl. Primer Mix	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur
<b>Ingestion</b>	pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Multi Enzyme	No specific data.
	10X QuikChange Lightning Multi Buffer	No specific data.
	dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	QuikChange Multi Control Template	No specific data.
	QuikChange Multi Ctl. Primer Mix	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains
	pUC 18 DNA Control Plasmid	No specific data.

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

<b>Notes to physician</b>	: QuikSolution	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	QuikChange Lightning Multi Enzyme	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	10X QuikChange Lightning Multi Buffer	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	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.
	QuikChange Multi Control Template	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	QuikChange Multi Ctl. Primer Mix	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.

## Section 4. First aid measures

<b>Specific treatments</b>	:  QuikSolution	No specific treatment.
	QuikChange Lightning Multi Enzyme	No specific treatment.
	10X QuikChange Lightning Multi Buffer	No specific treatment.
	dNTP Mix	No specific treatment.
	Dpn I Enzyme	No specific treatment.
	QuikChange Multi Control Template	No specific treatment.
	QuikChange Multi Ctl. Primer Mix	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.
<b>Protection of first-aiders</b>	:  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 Multi 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 Multi Buffer	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	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.
	QuikChange Multi Control Template	No action shall be taken involving any personal risk or without suitable training.
	QuikChange Multi Ctl. Primer Mix	No action shall be taken involving any personal risk or without suitable training.
	XL10-Gold Ultracompetent cells	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

<b>Suitable extinguishing media</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li>   <li>Dpn I Enzyme</li>   <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li>   <li>XL10-Gold Ultracompetent cells</li>   <li>XL10-Gold 2-Mercaptoethanol</li>   <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> <li>Use an extinguishing agent suitable for the surrounding fire.</li> </ul>
<b>Unsuitable extinguishing media</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li> <li>XL10-Gold Ultracompetent cells</li> <li>XL10-Gold 2-Mercaptoethanol</li> <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>Do not use water jet.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> <li>None known.</li> </ul>

### 5.2 Special hazards arising from the substance or mixture

<b>Specific hazards arising from the chemical</b>	<ul style="list-style-type: none"> <li>☑ QuikSolution</li>   <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li>   <li>Dpn I Enzyme</li>   <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li>   <li>XL10-Gold Ultracompetent cells</li> </ul>	<ul style="list-style-type: none"> <li>Combustible liquid. 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. Runoff to sewer may create fire or explosion hazard.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> <li>In a fire or if heated, a pressure increase will occur and the container may burst.</li> </ul>
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## Section 5. Fire-fighting measures

### Hazardous thermal decomposition products

XL10-Gold 2-Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst.
pUC 18 DNA Control Plasmid	In a fire or if heated, a pressure increase will occur and the container may burst.
: QuikSolution	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
QuikChange Lightning Multi Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide
10X QuikChange Lightning Multi Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds metal oxide/oxides
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 metal oxide/oxides
QuikChange Multi Control Template	No specific data.
QuikChange Multi Ctl. Primer Mix	No specific data.
XL10-Gold Ultracompetent cells	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

## Section 5. Fire-fighting measures

### Special protective actions for fire-fighters

:  QuikSolution

QuikChange Lightning Multi 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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

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 Multi 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.

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.

QuikChange Multi 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.

QuikChange Multi Ctl. Primer 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.

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.

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.

### Special protective equipment for fire-fighters

:  QuikSolution

QuikChange Lightning Multi Enzyme

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

10X QuikChange Lightning Multi Buffer

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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

## Section 5. Fire-fighting measures

QuikChange Multi Control Template	equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
QuikChange Multi Ctl. Primer Mix	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.

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.

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.


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

QuikChange Lightning Multi Enzyme

10X QuikChange Lightning Multi Buffer

dNTP Mix


## Section 6. Accidental release measures

Dpn I Enzyme	touch or walk through spilled material. Put on appropriate personal protective equipment. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
QuikChange Multi 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.
QuikChange Multi Ctl. Primer 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.
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.
<b>For emergency responders :</b>  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 Multi 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 Multi 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".

## Section 6. Accidental release measures

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".
QuikChange Multi 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".
QuikChange Multi Ctl. Primer 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".
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".
XL10-Gold 2-Mercaptoethanol	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".
pUC 18 DNA Control Plasmid	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".

### 6.2 Environmental precautions

:  QuikSolution	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).
QuikChange Lightning Multi Enzyme	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
10X QuikChange Lightning Multi Buffer	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
dNTP Mix	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).
Dpn I Enzyme	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).
QuikChange Multi Control Template	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).

## Section 6. Accidental release measures

QuikChange Multi Ctl. Primer Mix	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).
XL10-Gold Ultracompetent cells	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).
XL10-Gold 2-Mercaptoethanol	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).
pUC 18 DNA Control Plasmid	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).

### 6.3 Methods and materials for containment and cleaning up

**Methods for cleaning up** :  QuikSolution

QuikChange Lightning Multi 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.
10X QuikChange Lightning Multi 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.
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.
QuikChange Multi 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.

## Section 6. Accidental release measures

QuikChange Multi Ctl. Primer Mix	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.
XL10-Gold Ultracompetent cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
XL10-Gold 2-Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
pUC 18 DNA Control Plasmid	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

#### Protective measures

: QuikSolution

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.


QuikChange Lightning Multi 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.

10X QuikChange Lightning Multi Buffer

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers

## Section 7. Handling and storage

		retain product residue and can be hazardous. Do not reuse container.
	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.
	QuikChange Multi Control Template	Put on appropriate personal protective equipment (see Section 8).
	QuikChange Multi Ctl. Primer Mix	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. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. 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).
<b>Advice on general occupational hygiene</b>	:  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 Multi 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 Multi 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



## Section 7. Handling and storage

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

## Section 7. Handling and storage

### 7.2 Conditions for safe storage, including any incompatibilities

: QuikSolution

Storage temperature: -20°C (-4°F). 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.

QuikChange Lightning Multi Enzyme

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.

10X QuikChange Lightning Multi Buffer

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

dNTP Mix

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

Dpn I Enzyme

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.

QuikChange Multi Control Template

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been

## Section 7. Handling and storage

QuikChange Multi Ctl. Primer Mix	opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. 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.
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.
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.
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.

### 7.3 Specific end use(s)

#### Recommendations

: QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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 applications, Professional applications.
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## Section 7. Handling and storage

<b>Industrial sector specific solutions</b>	<input checked="" type="checkbox"/> QuikSolution	Not applicable.
	QuikChange Lightning Multi Enzyme	Not applicable.
	10X QuikChange Lightning Multi Buffer	Not applicable.
	dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	QuikChange Multi Control Template	Not applicable.
	QuikChange Multi Ctl. Primer Mix	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<input checked="" type="checkbox"/> <b>QuikSolution</b> Dimethyl sulfoxide	<b>AIHA WEEL (United States, 10/2011).</b> TWA: 250 ppm 8 hours.
<b>QuikChange Lightning Multi Enzyme</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction <b>OSHA PEL (United States, 2/2013).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 2/2013).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust
<b>10X QuikChange Lightning Multi Buffer</b> Potassium chloride 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride Ammonium sulphate Polyoxyethylene octyl phenyl ether	None. None. None. None.
<b>dNTP Mix</b> 2'-Deoxyguanosine 5'-(tetrahydrogen triphosphate) 2'-Deoxyadenosine 5'-(tetrahydrogen triphosphate)	None. None.
<b>Dpn I Enzyme</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 2/2013).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust
Sodium chloride	None.
<b>XL10-Gold Ultracompetent cells</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable

## Section 8. Exposure controls/personal protection

<p>Dimethyl sulfoxide</p> <p>Potassium chloride</p> <p><b>XL10-Gold 2-Mercaptoethanol</b></p> <p>Sodium chloride</p> <p>2-Mercaptoethanol</p>	<p>fraction TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 2/2013).</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m<sup>3</sup> 8 hours. Form: Total dust <b>AIHA WEEL (United States, 10/2011).</b> TWA: 250 ppm 8 hours. None.</p> <p>None. <b>AIHA WEEL (United States, 10/2011).</b> <b>Absorbed through skin.</b> 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 and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

### 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.

**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

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>Color</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>Odor</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>Odor threshold</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>pH</b>	:	

## Section 9. Physical and chemical properties

	☑	QuikSolution	Not available.
		QuikChange Lightning Multi Enzyme	8.2
		10X QuikChange Lightning Multi Buffer	8.8
		dNTP Mix	7.5
		Dpn I Enzyme	Not available.
		QuikChange Multi Control Template	7.5
		QuikChange Multi Ctl. Primer Mix	6.4
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold 2-Mercaptoethanol	7.5
		pUC 18 DNA Control Plasmid	7.5
<b>Melting point</b>	:	☑	18.4°C (65.1°F)
		QuikChange Lightning Multi Enzyme	Not available.
		10X QuikChange Lightning Multi Buffer	Not available.
		dNTP Mix	Not available.
		Dpn I Enzyme	Not available.
		QuikChange Multi Control Template	0°C (32°F)
		QuikChange Multi Ctl. Primer Mix	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)
<b>Boiling point</b>	:	☑	188.8°C (371.8°F)
		QuikChange Lightning Multi Enzyme	Not available.
		10X QuikChange Lightning Multi Buffer	Not available.
		dNTP Mix	Not available.
		Dpn I Enzyme	Not available.
		QuikChange Multi Control Template	100°C (212°F)
		QuikChange Multi Ctl. Primer Mix	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)
<b>Flash point</b>	:	☑	Closed cup: 85°C (185°F) Open cup: 87°C (188.6°F)
		QuikChange Lightning Multi Enzyme	Not available.
		10X QuikChange Lightning Multi Buffer	Not available.
		dNTP Mix	Not available.
		Dpn I Enzyme	Not available.
		QuikChange Multi Control Template	Not available.
		QuikChange Multi Ctl. Primer Mix	Not available.
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold 2-Mercaptoethanol	Not available.
		pUC 18 DNA Control Plasmid	Not available.

## Section 9. Physical and chemical properties

<b>Evaporation rate</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	0.026 (butyl acetate = 1) Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
<b>Flammability (solid, gas)</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
<b>Lower and upper explosive (flammable) limits</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Lower: 2.6% Upper: 42% Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
<b>Vapor pressure</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	0.056 kPa (0.42 mm Hg) [room temperature] Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
<b>Vapor density</b>	:	



## Section 9. Physical and chemical properties

	☑ QuikSolution	2.71 [Air = 1]
	QuikChange Lightning Multi Enzyme	Not available.
	10X QuikChange Lightning Multi Buffer	Not available.
	dNTP Mix	Not available.
	Dpn I Enzyme	Not available.
	QuikChange Multi Control Template	Not available.
	QuikChange Multi Ctl. Primer Mix	Not available.
	XL10-Gold Ultracompetent cells	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
	pUC 18 DNA Control Plasmid	Not available.
<b>Relative density</b>	: ☑ QuikSolution	1.1
	QuikChange Lightning Multi Enzyme	Not available.
	10X QuikChange Lightning Multi Buffer	Not available.
	dNTP Mix	Not available.
	Dpn I Enzyme	Not available.
	QuikChange Multi Control Template	Not available.
	QuikChange Multi Ctl. Primer Mix	Not available.
	XL10-Gold Ultracompetent cells	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
	pUC 18 DNA Control Plasmid	Not available.
<b>Solubility</b>	: ☑ QuikSolution	Easily soluble in the following materials: cold water and hot water.
	QuikChange Lightning Multi Enzyme	Soluble in the following materials: cold water and hot water.
	10X QuikChange Lightning Multi Buffer	Easily soluble in the following materials: cold water and hot water.
	dNTP Mix	Easily soluble in the following materials: cold water and hot water.
	Dpn I Enzyme	Soluble in the following materials: cold water and hot water.
	QuikChange Multi Control Template	Easily soluble in the following materials: cold water and hot water.
	QuikChange Multi Ctl. Primer Mix	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.
<b>Partition coefficient: n-octanol/water</b>	: ☑ QuikSolution	-2.029
	QuikChange Lightning Multi Enzyme	Not available.
	10X QuikChange Lightning Multi Buffer	Not available.
	dNTP Mix	Not available.
	Dpn I Enzyme	Not available.
	QuikChange Multi Control Template	Not available.
	QuikChange Multi Ctl. Primer Mix	Not available.
	XL10-Gold Ultracompetent cells	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.

## Section 9. Physical and chemical properties

	pUC 18 DNA Control Plasmid	Not available.
<b>Auto-ignition temperature</b>	: <input checked="" type="checkbox"/> QuikSolution	300 to 302°C (572 to 575.6°F)
	QuikChange Lightning Multi Enzyme	Not available.
	10X QuikChange Lightning Multi Buffer	Not available.
	dNTP Mix	Not available.
	Dpn I Enzyme	Not available.
	QuikChange Multi Control Template	Not available.
	QuikChange Multi Ctl. Primer Mix	Not available.
	XL10-Gold Ultracompetent cells	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
	pUC 18 DNA Control Plasmid	Not available.
<b>Decomposition temperature</b>	: <input checked="" type="checkbox"/> QuikSolution	140 to 189°C (284 to 372.2°F)
	QuikChange Lightning Multi Enzyme	Not available.
	10X QuikChange Lightning Multi Buffer	Not available.
	dNTP Mix	Not available.
	Dpn I Enzyme	Not available.
	QuikChange Multi Control Template	Not available.
	QuikChange Multi Ctl. Primer Mix	Not available.
	XL10-Gold Ultracompetent cells	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
	pUC 18 DNA Control Plasmid	Not available.
<b>Viscosity</b>	: <input checked="" type="checkbox"/> QuikSolution	Dynamic (room temperature): 2.14 mPa·s (2.14 cP)
	QuikChange Lightning Multi Enzyme	Not available.
	10X QuikChange Lightning Multi Buffer	Not available.
	dNTP Mix	Not available.
	Dpn I Enzyme	Not available.
	QuikChange Multi Control Template	Not available.
	QuikChange Multi Ctl. Primer Mix	Not available.
	XL10-Gold Ultracompetent cells	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
	pUC 18 DNA Control Plasmid	Not available.


## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: <input checked="" type="checkbox"/> QuikSolution	No specific test data related to reactivity available for this product or its ingredients.
	QuikChange Lightning Multi Enzyme	No specific test data related to reactivity available for this product or its ingredients.
	10X QuikChange Lightning Multi Buffer	No specific test data related to reactivity available for this product or its ingredients.
	dNTP Mix	No specific test data related to reactivity available for this product or its ingredients.
	Dpn I Enzyme	No specific test data related to reactivity available for this product or its ingredients.
	QuikChange Multi Control Template	No specific test data related to reactivity available for this product or its ingredients.
	QuikChange Multi Ctl. Primer Mix	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


## Section 10. Stability and reactivity

XL10-Gold 2-Mercaptoethanol	for this product or its ingredients. 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 Multi Enzyme	The product is stable.
10X QuikChange Lightning Multi Buffer	The product is stable.
dNTP Mix	The product is stable.
Dpn I Enzyme	The product is stable.
QuikChange Multi Control Template	The product is stable.
QuikChange Multi Ctl. Primer Mix	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 Multi Enzyme	Under normal conditions of storage and use, hazardous reactions will not occur.
10X QuikChange Lightning Multi Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
dNTP Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
Dpn I Enzyme	Under normal conditions of storage and use, hazardous reactions will not occur.
QuikChange Multi Control Template	Under normal conditions of storage and use, hazardous reactions will not occur.
QuikChange Multi Ctl. Primer Mix	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 Multi Enzyme	No specific data.
10X QuikChange Lightning Multi Buffer	No specific data.
dNTP Mix	No specific data.
Dpn I Enzyme	No specific data.
QuikChange Multi Control Template	No specific data.
QuikChange Multi Ctl. Primer Mix	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.

## Section 10. Stability and reactivity

### 10.5 Incompatible materials : QuikSolution

QuikChange Lightning Multi Enzyme  
 10X QuikChange Lightning Multi Buffer  
 dNTP Mix  
 Dpn I Enzyme  
 QuikChange Multi Control Template  
 QuikChange Multi Ctl. Primer Mix  
 XL10-Gold Ultracompetent cells  
 XL10-Gold 2-Mercaptoethanol  
 pUC 18 DNA Control Plasmid

Reactive or incompatible with the following materials:  
 oxidizing materials  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.  
 May react or be incompatible with oxidizing materials.

### 10.6 Hazardous decomposition products : QuikSolution

QuikChange Lightning Multi Enzyme  
 10X QuikChange Lightning Multi Buffer  
 dNTP Mix  
 Dpn I Enzyme  
 QuikChange Multi Control Template  
 QuikChange Multi Ctl. Primer Mix  
 XL10-Gold Ultracompetent cells  
 XL10-Gold 2-Mercaptoethanol  
 pUC 18 DNA Control Plasmid

Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
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 Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>QuikSolution</b> Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
<b>QuikChange Lightning Multi Enzyme</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
<b>10X QuikChange Lightning Multi Buffer</b> Potassium chloride Ammonium sulphate	LD50 Oral LD50 Oral	Rat Rat	2600 mg/kg 2840 mg/kg	- -
<b>Dpn I Enzyme</b> Glycerol Sodium chloride	LD50 Oral LD50 Oral	Rat Rat	12600 mg/kg 3000 mg/kg	- -
<b>XL10-Gold Ultracompetent cells</b> 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	- - - -
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride 2-Mercaptoethanol	LD50 Oral LD50 Dermal LD50 Oral	Rat Rabbit Rat	3000 mg/kg 200 mg/kg 244 mg/kg	- - -

#### Irritation/Corrosion

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

## Section 11. Toxicological information

Polyoxyethylene octyl phenyl ether	Eyes - Moderate irritant	Rabbit	-	24 hours 10 microliters	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 microliters	-
<b>Dpn I Enzyme</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant Skin - Mild irritant	Rabbit Rabbit	- -	10 milligrams 24 hours 500 milligrams	- -
<b>XL10-Gold Ultracompetent cells</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Potassium chloride	Skin - Mild irritant	Rabbit	-	100 milligrams	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant Skin - Mild irritant	Rabbit Rabbit	- -	10 milligrams 24 hours 500 milligrams	- -
	2-Mercaptoethanol	Rabbit	-	2 milligrams	-

### Sensitization

Not available.

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

## Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
<b>10X QuikChange Lightning Multi Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Category 3	Not applicable.	Respiratory tract irritation
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

### Information on the likely routes of exposure

<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li> <li>XL10-Gold Ultracompetent cells</li> <li>XL10-Gold 2-Mercaptoethanol</li> <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>Routes of entry anticipated: Oral, Dermal, Inhalation.</li> <li>Routes of entry anticipated: Oral, Dermal, Inhalation.</li> <li>Routes of entry anticipated: Oral, Dermal, Inhalation.</li> <li>Not available.</li> <li>Routes of entry anticipated: Oral, Dermal, Inhalation.</li> <li>Not available.</li> <li>Not available.</li> <li>Routes of entry anticipated: Oral, Dermal, Inhalation.</li> <li>Routes of entry anticipated: Oral, Dermal, Inhalation.</li> <li>Not available.</li> </ul>
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### Potential acute health effects

#### Eye contact

<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> <li>QuikChange Multi Ctl. Primer Mix</li> <li>XL10-Gold Ultracompetent cells</li> <li>XL10-Gold 2-Mercaptoethanol</li> <li>pUC 18 DNA Control Plasmid</li> </ul>	<ul style="list-style-type: none"> <li>Causes eye irritation.</li> <li>Causes eye irritation.</li> <li>Causes serious eye irritation.</li> <li>No known significant effects or critical hazards.</li> <li>Causes serious eye irritation.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>Causes eye irritation.</li> <li>Causes serious eye damage.</li> <li>No known significant effects or critical hazards.</li> </ul>
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#### Inhalation

<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> QuikSolution</li> <li>QuikChange Lightning Multi Enzyme</li> <li>10X QuikChange Lightning Multi Buffer</li> <li>dNTP Mix</li> <li>Dpn I Enzyme</li> <li>QuikChange Multi Control Template</li> </ul>	<ul style="list-style-type: none"> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> <li>No known significant effects or critical hazards.</li> </ul>
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## Section 11. Toxicological information

<b>Skin contact</b>	:	QuikChange Multi Ctl. Primer Mix	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.
		QuikSolution	No known significant effects or critical hazards.
		QuikChange Lightning Multi Enzyme	No known significant effects or critical hazards.
		10X QuikChange Lightning Multi Buffer	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		Dpn I Enzyme	No known significant effects or critical hazards.
		QuikChange Multi Control Template	No known significant effects or critical hazards.
<b>Ingestion</b>	:	QuikChange Multi Ctl. Primer Mix	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.
		QuikSolution	No known significant effects or critical hazards.
		QuikChange Lightning Multi Enzyme	No known significant effects or critical hazards.
		10X QuikChange Lightning Multi Buffer	No known significant effects or critical hazards.
		dNTP Mix	No known significant effects or critical hazards.
		Dpn I Enzyme	No known significant effects or critical hazards.
		QuikChange Multi Control Template	No known significant effects or critical hazards.
	:	QuikChange Multi Ctl. Primer Mix	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

<b>Eye contact</b>	:	QuikSolution	Adverse symptoms may include the following: irritation watering redness
		QuikChange Lightning Multi Enzyme	Adverse symptoms may include the following:  irritation watering redness
		10X QuikChange Lightning Multi Buffer	Adverse symptoms may include the following:  pain or irritation watering redness
		dNTP Mix	No specific data.
		Dpn I Enzyme	Adverse symptoms may include the following: pain or irritation watering redness
		QuikChange Multi Control Template	No specific data.
		QuikChange Multi Ctl. Primer Mix	No specific data.
		XL10-Gold Ultracompetent cells	Adverse symptoms may include the following: irritation watering redness



## Section 11. Toxicological information

	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness
<b>Inhalation</b>	: pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Multi Enzyme	No specific data.
	10X QuikChange Lightning Multi Buffer	No specific data.
	dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	QuikChange Multi Control Template	No specific data.
	QuikChange Multi Ctl. Primer Mix	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	No specific data.
<b>Skin contact</b>	: pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Multi Enzyme	No specific data.
	10X QuikChange Lightning Multi Buffer	No specific data.
	dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	QuikChange Multi Control Template	No specific data.
	QuikChange Multi Ctl. Primer Mix	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur
<b>Ingestion</b>	pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Multi Enzyme	No specific data.
	10X QuikChange Lightning Multi Buffer	No specific data.
	dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	QuikChange Multi Control Template	No specific data.
	QuikChange Multi Ctl. Primer Mix	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains
pUC 18 DNA Control Plasmid	No specific data.	

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

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.





#### Long term exposure

**Potential immediate effects** : Not available.

## Section 11. Toxicological information

**Potential delayed effects** : Not available.

### Potential chronic health effects

<b>General</b>	:  QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol	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. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
<b>Carcinogenicity</b>	:  QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>Mutagenicity</b>	:  QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>Teratogenicity</b>	:  QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.

## Section 11. Toxicological information

<b>Developmental effects</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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.
<b>Fertility effects</b>	: <input checked="" type="checkbox"/> QuikSolution QuikChange Lightning Multi Enzyme 10X QuikChange Lightning Multi Buffer dNTP Mix Dpn I Enzyme QuikChange Multi Control Template QuikChange Multi Ctl. Primer Mix 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. 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.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
<input checked="" type="checkbox"/> 10X QuikChange Lightning Multi Buffer Oral	25767.7 mg/kg
Dpn I Enzyme Oral	130435.3 mg/kg
XL10-Gold Ultracompetent cells Oral	136842.1 mg/kg
XL10-Gold 2-Mercaptoethanol Oral	4615.5 mg/kg
Dermal	4545.5 mg/kg
Inhalation (vapors)	45.45 mg/l

## Section 12. Ecological information

### 12.1 Toxicity

## Section 12. Ecological information

Product/ingredient name	Result	Species	Exposure
<b>QuikSolution</b> 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
<b>QuikChange Lightning Multi Enzyme</b> Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
<b>10X QuikChange Lightning Multi Buffer</b> 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
Ammonium sulphate	Acute EC50 141460 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 12.77 mg/l Fresh water	Crustaceans - Pseudosida ramosa - Neonate	48 hours
	Acute LC50 880000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute LC50 2.6 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Young	48 hours
	Acute LC50 14000 to 15000 µg/l Fresh water	Daphnia - Daphnia magna - Young	48 hours
	Acute LC50 68 µg/l Fresh water	Fish - Oncorhynchus gorbuscha - Alevin	96 hours
	Chronic NOEC 7.5 mg/l Marine water	Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours
Polyoxyethylene octyl phenyl ether	Chronic NOEC 143 µg/l Marine water	Fish - Salmo salar - Post-smolt	5 weeks
	Acute LC50 5.85 mg/l Fresh water	Crustaceans - Ceriodaphnia rigaudi - Neonate	48 hours
	Acute LC50 11.2 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
<b>Dpn I Enzyme</b> Glycerol Sodium chloride	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	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 IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1661 mg/l Fresh water	Daphnia - Daphnia magna	48 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
<b>XL10-Gold Ultracompetent cells</b> Glycerol Dimethyl sulfoxide	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	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
	Acute EC50 1337000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
Potassium chloride			

## Section 12. Ecological information

<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride	Acute EC50 9.24 g/L Fresh water	Algae - Desmodesmus subspicatus	72 hours
	Acute EC50 141460 µg/l Fresh water Acute LC50 12.77 mg/l Fresh water	Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate	48 hours 48 hours
	Acute LC50 880000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute EC50 2430000 µg/l Fresh water Acute EC50 519.6 mg/l Fresh water Acute IC50 6.87 g/L Fresh water Acute LC50 1661 mg/l Fresh water Acute LC50 1000000 µg/l Fresh water Chronic LC10 781 mg/l Fresh water	Algae - Navicula seminulum Crustaceans - Cypris subglobosa Aquatic plants - Lemna minor Daphnia - Daphnia magna Fish - Morone saxatilis - Larvae Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 48 hours 96 hours 48 hours 96 hours 3 weeks
	Chronic NOEC 6 g/L Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Aquatic plants - Lemna minor Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	96 hours 21 days 8 weeks

### 12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>10X QuikChange Lightning Multi Buffer</b> Ammonium sulphate Polyoxyethylene octyl phenyl ether	- -	- -	Readily Readily

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>QuikSolution</b> Dimethyl sulfoxide	-2.029	3.16	low
<b>QuikChange Lightning Multi Enzyme</b> Glycerol	-1.76	-	low
<b>10X QuikChange Lightning Multi Buffer</b> Potassium chloride Ammonium sulphate Polyoxyethylene octyl phenyl ether	-0.46 -5.1 4.86	- - -	low low high
<b>Dpn I Enzyme</b> Glycerol	-1.76	-	low
<b>XL10-Gold Ultracompetent cells</b> Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	low low low
<b>XL10-Gold</b>			

## Section 12. Ecological information

<b>2-Mercaptoethanol</b> 2-Mercaptoethanol	-0.056	-	low
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### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : 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

### Regulatory information

**DOT / IMDG / IATA** : Not regulated.

## 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) PAIR**: Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-; Polyoxyethylene octyl phenyl ether  
**United States inventory (TSCA 8b)**: All components are listed or exempted.  
**Clean Water Act (CWA) 311**: Edetic acid

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** :  listed

**Clean Air Act Section 602 Class I Substances** : Not listed

## Section 15. Regulatory information

**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** :  Fire hazard  
Immediate (acute) health hazard

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
<input checked="" type="checkbox"/> <b>QuikSolution</b> Dimethyl sulfoxide	100	Yes.	No.	No.	Yes.	No.
<b>QuikChange Lightning Multi Enzyme</b> Glycerol	≥50 - ≤75	No.	No.	No.	Yes.	No.
<b>10X QuikChange Lightning Multi Buffer</b> Potassium chloride	≤5	No.	No.	No.	Yes.	No.
2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	≤5	No.	No.	No.	Yes.	No.
Ammonium sulphate	≤3	No.	No.	No.	Yes.	No.
Polyoxyethylene octyl phenyl ether	≤2.3	No.	No.	No.	Yes.	No.
<b>dNTP Mix</b> 2'-Deoxyguanosine 5'-(tetrahydrogen triphosphate)	≤3	No.	No.	No.	Yes.	No.
2'-Deoxyadenosine 5'-(tetrahydrogen triphosphate)	≤3	No.	No.	No.	Yes.	No.
<b>Dpn I Enzyme</b> Glycerol	≥50 - ≤75	No.	No.	No.	Yes.	No.
Sodium chloride	≤3	No.	No.	No.	Yes.	No.
<b>XL10-Gold Ultracompetent cells</b> Glycerol	≥10 - ≤25	No.	No.	No.	Yes.	No.
Dimethyl sulfoxide	≤10	Yes.	No.	No.	Yes.	No.
Potassium chloride	≤3	No.	No.	No.	Yes.	No.
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride	≥10 - ≤25	No.	No.	No.	Yes.	No.
2-Mercaptoethanol	≤5	Yes.	No.	No.	Yes.	No.

### SARA 313

## Section 15. Regulatory information

	Product name	CAS number	%
Form R - Reporting requirements	10X QuikChange Lightning Multi Buffer Ammonium sulphate	7783-20-2	≤3
Supplier notification	10X QuikChange Lightning Multi Buffer Ammonium sulphate	7783-20-2	≤3

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: DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-; GLYCERIN; 1,2,3-PROPANETRIOL
- Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL
- California Prop. 65**

No products were found.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol (Annexes A, B, C, E)

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



## Section 16. Other information

### History

**Date of issue** : 10/19/2016

**Date of previous issue** : 10/27/2015.

**Version** : 4

✔ Indicates information that has changed from previously issued version.

### Notice to reader

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