

SAFETY DATA SHEET



SureSelect Max Enzymatic Fragmentation Library Preparation Module, 16_96 Reactions

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

1.1 Product identifier

Product name	: SureSelect Max Enzymatic Fragmentation Library Preparation Module, 16_96 Reactions		
Part no. (chemical kit)	: 5280-0063, 5280-0064		
Part no.	: Frag/A-Tail Buffer	5271-0076 / 5271-0080	
	: Frag/A-Tail Enzyme Mix	5271-0077 / 5271-0081	
	: Ligation Master Mix	5271-0078 / 5271-0082	
	: Amplification Master Mix	5271-0079 / 5271-0083	

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

Identified uses	: Analytical reagent. For research use only.		
	: Frag/A-Tail Buffer	0.072 ml (16 reactions) / 0.512 ml (96 reactions)	
	: Frag/A-Tail Enzyme Mix	0.108 ml (16 reactions) / 0.768 ml (96 reactions)	
	: Ligation Master Mix	0.36 ml (16 reactions) / 2.32 ml (96 reactions)	
	: Amplification Master Mix	0.45 ml (16 reactions) / 2.84 ml (96 reactions)	
Uses advised against	: Not for use in diagnostic procedures.		

1.3 Details of the supplier of the safety data sheet

Agilent Technologies LDA UK Ltd.
5500 Lakeside Cheadle Royal Business Park,
Cheadle, Cheshire, SK8 3GR
United Kingdom
Tel: +44 (0) 345 712 5292

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +44 20 3807 3798

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition	: Frag/A-Tail Buffer	Mixture
	: Frag/A-Tail Enzyme Mix	Mixture
	: Ligation Master Mix	Mixture
	: Amplification Master Mix	Mixture

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

Frag/A-Tail Buffer

H302	ACUTE TOXICITY (oral)	Category 4
H371	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	Category 2
H411	LONG-TERM (CHRONIC) AQUATIC HAZARD	Category 2

Amplification Master Mix

H302	ACUTE TOXICITY (oral)	Category 4
H315	SKIN CORROSION/IRRITATION	Category 2
H371	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	Category 2

SECTION 2: Hazards identification

H412	LONG-TERM (CHRONIC) AQUATIC HAZARD	Category 3
Frag/A-Tail Buffer		The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.
Frag/A-Tail Enzyme Mix		The product is not classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.
Ligation Master Mix		The product is not classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.
Amplification Master Mix		The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

Ingredients of unknown toxicity	: Frag/A-Tail Buffer	Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10% Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30% Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 1 - 10%
	Frag/A-Tail Enzyme Mix	Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: > 60%
	Ligation Master Mix	Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: > 60%
	Amplification Master Mix	Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 30 - 60%
Ingredients of unknown ecotoxicity	: Frag/A-Tail Buffer	Contains 1% of components with unknown hazards to the aquatic environment

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

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

2.2 Label elements

Hazard pictograms : Frag/A-Tail Buffer



Amplification Master Mix



Signal word : Frag/A-Tail Buffer Warning
Frag/A-Tail Enzyme Mix No signal word.
Ligation Master Mix No signal word.
Amplification Master Mix Warning

Hazard statements : Frag/A-Tail Buffer H302 - Harmful if swallowed.
H371 - May cause damage to organs.
H412 - Harmful to aquatic life with long lasting effects.
Frag/A-Tail Enzyme Mix No known significant effects or critical hazards.
Ligation Master Mix No known significant effects or critical hazards.
Amplification Master Mix H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H371 - May cause damage to organs.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention : Frag/A-Tail Buffer P273 - Avoid release to the environment.
P260 - Do not breathe vapour.
P270 - Do not eat, drink or smoke when using this product.
P264 - Wash thoroughly after handling.
Frag/A-Tail Enzyme Mix Not applicable.
Ligation Master Mix Not applicable.
Amplification Master Mix P280 - Wear protective gloves.
P273 - Avoid release to the environment.

SECTION 2: Hazards identification

P260 - Do not breathe vapour.
P270 - Do not eat, drink or smoke when using this product.

Response	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	P391 - Collect spillage. Not applicable. Not applicable. P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor.
Storage	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not applicable. Not applicable. Not applicable. Not applicable.
Disposal	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable. Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients	: Frag/A-Tail Buffer Amplification Master Mix	tetramethylammonium chloride tetramethylammonium chloride
Supplemental label elements	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not applicable. Safety data sheet available on request. Safety data sheet available on request. Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not applicable. Not applicable. Not applicable. Not applicable.
<u>Special packaging requirements</u>		
Containers to be fitted with child-resistant fastenings	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not applicable. Not applicable. Not applicable. Not applicable.
Tactile warning of danger	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not applicable. Not applicable. Not applicable. Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Other hazards which do not result in classification	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	None known. None known. None known. None known.

SECTION 3: Composition/information on ingredients

3.1 Substances : Frag/A-Tail Buffer Mixture
 Frag/A-Tail Enzyme Mix Mixture
 Ligation Master Mix Mixture
 Amplification Master Mix Mixture

Product/ingredient name	Identifiers	%	Classification	Type
Frag/A-Tail Buffer Magnesium chloride	EC: 232-094-6 CAS: 7786-30-3	≥10 - <25	Aquatic Chronic 1, H410 (M=1)	[1]
tetramethylammonium chloride	EC: 200-880-8 CAS: 75-57-0	<10	Acute Tox. 2, H300 Acute Tox. 3, H311 Skin Irrit. 2, H315 STOT SE 1, H370 (central nervous system (CNS)) (oral) Aquatic Chronic 2, H411	[1]
Frag/A-Tail Enzyme Mix Glycerol	UK (GB) REACH #: Annex V REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[1]
Ligation Master Mix Glycerol	UK (GB) REACH #: Annex V REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[1]
Amplification Master Mix Glycerol	UK (GB) REACH #: Annex V REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥25 - ≤50	Not classified.	[2]
Trometamol	EC: 201-064-4 CAS: 77-86-1	<10	Skin Irrit. 2, H315 Eye Irrit. 2, H319	[1]
tetramethylammonium chloride	EC: 200-880-8 CAS: 75-57-0	<10	Acute Tox. 2, H300 Acute Tox. 3, H311 Skin Irrit. 2, H315 STOT SE 1, H370 (central nervous system (CNS)) (oral) Aquatic Chronic 2, H411 See Section 16 for the full text of the H statements declared above.	[1]

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

Type
 Frag/A-Tail Buffer [1] Substance classified with a health or environmental hazard
 Frag/A-Tail Enzyme Mix [1] Substance with a workplace exposure limit
 Ligation Master Mix [1] Substance with a workplace exposure limit
 Amplification Master Mix [1] Substance classified with a health or environmental hazard
 [2] Substance with a workplace exposure limit

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: Frag/A-Tail 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 following exposure or if feeling unwell. If necessary, call a poison center or physician.
	Frag/A-Tail Enzyme 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.
	Ligation Master 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.
	Amplification Master Mix	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. If necessary, call a poison center or physician.
Inhalation	: Frag/A-Tail Buffer	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If necessary, call a poison center or physician. 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.
	Frag/A-Tail Enzyme Mix	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	Ligation Master Mix	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	Amplification Master Mix	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 following exposure or if feeling unwell. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Skin contact	: Frag/A-Tail Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention following exposure or if feeling unwell. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	Frag/A-Tail Enzyme Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Ligation Master Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

SECTION 4: First aid measures

	Amplification Master Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: Frag/A-Tail Buffer	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or 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.
	Frag/A-Tail Enzyme Mix	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	Ligation Master Mix	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	Amplification Master Mix	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or 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.
Protection of first-aiders	: Frag/A-Tail 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.
	Frag/A-Tail Enzyme Mix	No action shall be taken involving any personal risk or without suitable training.
	Ligation Master Mix	No action shall be taken involving any personal risk or without suitable training.
	Amplification Master Mix	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	Adverse symptoms may include the following: pain or irritation watering redness

SECTION 4: First aid measures

Inhalation	:	Frag/A-Tail Buffer	No specific data.
		Frag/A-Tail Enzyme Mix	No specific data.
		Ligation Master Mix	No specific data.
		Amplification Master Mix	No specific data.
Skin contact	:	Frag/A-Tail Buffer	No specific data.
		Frag/A-Tail Enzyme Mix	No specific data.
		Ligation Master Mix	No specific data.
		Amplification Master Mix	Adverse symptoms may include the following: irritation redness
Ingestion	:	Frag/A-Tail Buffer	No specific data.
		Frag/A-Tail Enzyme Mix	No specific data.
		Ligation Master Mix	No specific data.
		Amplification Master Mix	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	:	Frag/A-Tail 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.
		Frag/A-Tail Enzyme Mix	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Ligation Master Mix	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Amplification Master 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.
Specific treatments	:	Frag/A-Tail Buffer	No specific treatment.
		Frag/A-Tail Enzyme Mix	No specific treatment.
		Ligation Master Mix	No specific treatment.
		Amplification Master Mix	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Frag/A-Tail Buffer	Use an extinguishing agent suitable for the surrounding fire.
		Frag/A-Tail Enzyme Mix	Use an extinguishing agent suitable for the surrounding fire.
		Ligation Master Mix	Use an extinguishing agent suitable for the surrounding fire.
		Amplification Master Mix	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	:	Frag/A-Tail Buffer	None known.
		Frag/A-Tail Enzyme Mix	None known.
		Ligation Master Mix	None known.
		Amplification Master Mix	None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	:	Frag/A-Tail Buffer	In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
		Frag/A-Tail Enzyme Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
		Ligation Master Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
		Amplification Master Mix	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

SECTION 5: Firefighting measures

Hazardous combustion products	: Frag/A-Tail Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides halogenated compounds metal oxide/oxides
	Frag/A-Tail Enzyme Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	Ligation Master Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	Amplification Master Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds

5.3 Advice for firefighters

Special protective actions for fire-fighters	: Frag/A-Tail 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.
	Frag/A-Tail Enzyme 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.
	Ligation Master 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.
	Amplification Master 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.
Special protective equipment for fire-fighters	: Frag/A-Tail Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Frag/A-Tail Enzyme Mix	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Ligation Master Mix	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Amplification Master Mix	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	: Frag/A-Tail Buffer	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Frag/A-Tail Enzyme Mix	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
	Ligation Master 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

SECTION 6: Accidental release measures

For emergency responders

	Amplification Master Mix	not touch or walk through spilt material. Put on appropriate personal protective equipment. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
:	Frag/A-Tail Buffer	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	Frag/A-Tail Enzyme Mix	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	Ligation Master Mix	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	Amplification Master Mix	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

:	Frag/A-Tail Buffer	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.
	Frag/A-Tail Enzyme Mix	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Ligation Master Mix	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Amplification Master Mix	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up

:	Frag/A-Tail 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.
	Frag/A-Tail Enzyme 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.
	Ligation Master 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

SECTION 6: Accidental release measures

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

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures	: Frag/A-Tail Buffer	Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	Frag/A-Tail Enzyme Mix	Put on appropriate personal protective equipment (see Section 8).
	Ligation Master Mix	Put on appropriate personal protective equipment (see Section 8).
	Amplification Master Mix	Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	: Frag/A-Tail Buffer	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	Frag/A-Tail Enzyme 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.
	Ligation Master 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.
	Amplification Master Mix	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.

SECTION 7: Handling and storage

7.2 Conditions for safe storage, including any incompatibilities

Storage	: Frag/A-Tail 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. 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Frag/A-Tail Enzyme Mix	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Ligation Master Mix	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Amplification Master 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. 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
Frag/A-Tail Buffer E2	200 tonne	500 tonne

7.3 Specific end use(s)

Recommendations	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications.
Industrial sector specific solutions	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not available. Not available. Not available. Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Frag/A-Tail Enzyme Mix Glycerol	EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 10 mg/m ³ 8 hours. Form: Mist
Ligation Master Mix Glycerol	EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 10 mg/m ³ 8 hours. Form: Mist
Amplification Master Mix Glycerol	EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 10 mg/m ³ 8 hours. Form: Mist

Biological exposure indices

No exposure indices known.

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

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects	
Frag/A-Tail Buffer Magnesium chloride	DNEL	Long term Oral	7 mg/kg bw/day	General population	Systemic	
	tetramethylammonium chloride	DNEL	Long term Oral	0.25 mg/kg bw/day	General population	Systemic
		DNEL	Long term Dermal	0.25 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.4 mg/kg bw/day	Workers	Systemic	
	DNEL	Long term Inhalation	1.76 mg/m ³	General population	Systemic	
	DNEL	Long term Inhalation	2.9 mg/m ³	Workers	Systemic	
Amplification Master Mix Trometamol	DNEL	Long term Oral	8.3 mg/kg bw/day	General population	Systemic	
	DNEL	Long term Inhalation	29 mg/m ³	General population	Systemic	
	DNEL	Long term Dermal	83.3 mg/kg bw/day	General population	Systemic	
	DNEL	Long term Inhalation	117.5 mg/m ³	Workers	Systemic	
	DNEL	Long term Dermal	166.7 mg/kg bw/day	Workers	Systemic	
	tetramethylammonium chloride	DNEL	Long term Oral	0.25 mg/kg bw/day	General population	Systemic
		DNEL	Long term Dermal	0.25 mg/kg bw/day	General population	Systemic
		DNEL	Long term Dermal	0.4 mg/kg bw/day	Workers	Systemic
		DNEL	Long term Inhalation	1.76 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	2.9 mg/m ³	Workers	Systemic	

PNECs

No PNECs available

SECTION 8: Exposure controls/personal protection

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour 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.

Individual protection measures

Hygiene measures : Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

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

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. 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.

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

SECTION 9: Physical and chemical properties

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state	: Frag/A-Tail Buffer	Liquid.
	: Frag/A-Tail Enzyme Mix	Liquid.
	: Ligation Master Mix	Liquid.
	: Amplification Master Mix	Liquid.
Colour	: Frag/A-Tail Buffer	Not available.
	: Frag/A-Tail Enzyme Mix	Not available.
	: Ligation Master Mix	Not available.
	: Amplification Master Mix	Not available.
Odour	: Frag/A-Tail Buffer	Not available.
	: Frag/A-Tail Enzyme Mix	Not available.
	: Ligation Master Mix	Not available.
	: Amplification Master Mix	Not available.

SECTION 9: Physical and chemical properties

Odour threshold : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

Melting point/freezing point : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

Initial boiling point and boiling range : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

Flammability : Frag/A-Tail Buffer Not applicable.
 Frag/A-Tail Enzyme Mix Not applicable.
 Ligation Master Mix Not applicable.
 Amplification Master Mix Not applicable.

Upper/lower flammability or explosive limits : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

Flash point :

Ingredient name	Closed cup		Open cup	
	°C	Method	°C	Method
Frag/A-Tail Enzyme Mix				
glycerol	-	-	177	-
Ligation Master Mix				
Poly(oxy-1,2-ethanediyl),α-hydro-ω-hydroxy- Ethane-1,2-diol, ethoxylated	171 to 235	-	199 to 238	-
glycerol	-	-	177	-
Amplification Master Mix				
glycerol	-	-	177	-

Auto-ignition temperature :

Ingredient name	°C	Method
Frag/A-Tail Enzyme Mix		
glycerol	370	-
Ligation Master Mix		
Poly(oxy-1,2-ethanediyl),α-hydro-ω-hydroxy- Ethane-1,2-diol, ethoxylated	360	-
glycerol	370	-
Amplification Master Mix		
glycerol	370	-

Decomposition temperature : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

SECTION 9: Physical and chemical properties

pH : Frag/A-Tail Buffer 8.3
 Frag/A-Tail Enzyme Mix 7
 Ligation Master Mix 7.8
 Amplification Master Mix 8.5

Viscosity : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

Solubility(ies)	Media	Result
	Frag/A-Tail Buffer water	Soluble
	Frag/A-Tail Enzyme Mix water	Soluble
	Ligation Master Mix water	Soluble
	Amplification Master Mix water	Soluble

Partition coefficient: n-octanol/water : Frag/A-Tail Buffer Not applicable.
 Frag/A-Tail Enzyme Mix Not applicable.
 Ligation Master Mix Not applicable.
 Amplification Master Mix Not applicable.

Vapour pressure	Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
		mm Hg	kPa	Method	mm Hg	kPa	Method
	Frag/A-Tail Buffer						
	water	17.5	2.3	-	92.258	12.3	-
	tetramethylammonium chloride	0.000000001	0.0000000013	EU A.4	-	-	-
	Frag/A-Tail Enzyme Mix						
	water	17.5	2.3	-	92.258	12.3	-
	glycerol	0.000075	0.00001	-	0.0025	0.00033	-
	Ligation Master Mix						
	water	17.5	2.3	-	92.258	12.3	-
	glycerol	0.000075	0.00001	-	0.0025	0.00033	-
	Amplification Master Mix						
	water	17.5	2.3	-	92.258	12.3	-
	trometamol	<0.00075006	<0.0001	-	-	-	-

Evaporation rate : Frag/A-Tail Buffer Not available.
 Frag/A-Tail Enzyme Mix Not available.
 Ligation Master Mix Not available.
 Amplification Master Mix Not available.

SECTION 9: Physical and chemical properties

Relative density	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.
Vapour density	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.
Explosive properties	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.
Oxidising properties	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.

Particle characteristics

Median particle size	: Frag/A-Tail Buffer	Not applicable.
	Frag/A-Tail Enzyme Mix	Not applicable.
	Ligation Master Mix	Not applicable.
	Amplification Master Mix	Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: Frag/A-Tail Buffer	No specific test data related to reactivity available for this product or its ingredients.
	Frag/A-Tail Enzyme Mix	No specific test data related to reactivity available for this product or its ingredients.
	Ligation Master Mix	No specific test data related to reactivity available for this product or its ingredients.
	Amplification Master Mix	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: Frag/A-Tail Buffer	The product is stable.
	Frag/A-Tail Enzyme Mix	The product is stable.
	Ligation Master Mix	The product is stable.
	Amplification Master Mix	The product is stable.
10.3 Possibility of hazardous reactions	: Frag/A-Tail Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
	Frag/A-Tail Enzyme Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
	Ligation Master Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
	Amplification Master Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.
10.5 Incompatible materials	: Frag/A-Tail Buffer	May react or be incompatible with oxidising materials.
	Frag/A-Tail Enzyme Mix	May react or be incompatible with oxidising materials.
	Ligation Master Mix	May react or be incompatible with oxidising materials.
	Amplification Master Mix	May react or be incompatible with oxidising materials.

SECTION 10: Stability and reactivity

10.6 Hazardous decomposition products	: Frag/A-Tail Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Frag/A-Tail Enzyme Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Ligation Master Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Amplification Master Mix	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
Frag/A-Tail Buffer				
Magnesium chloride	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat	2800 mg/kg	-
tetramethylammonium chloride	LD50 Dermal	Rabbit - Male, Female	200 to 500 mg/kg	-
	LD50 Oral	Rat	50 mg/kg	-
Frag/A-Tail Enzyme Mix				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Ligation Master Mix				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Amplification Master Mix				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Trometamol	LD50 Dermal	Rat	>5000 mg/kg	-
tetramethylammonium chloride	LD50 Dermal	Rabbit - Male, Female	200 to 500 mg/kg	-
	LD50 Oral	Rat	50 mg/kg	-

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
Frag/A-Tail Buffer					
Frag/A-Tail Buffer	1000	6000.0	N/A	N/A	N/A
Magnesium chloride	2800	N/A	N/A	N/A	N/A
tetramethylammonium chloride	50	300	N/A	N/A	N/A
Frag/A-Tail Enzyme Mix					
Glycerol	12600	N/A	N/A	N/A	N/A
Ligation Master Mix					
Glycerol	12600	N/A	N/A	N/A	N/A
Amplification Master Mix					
Amplification Master Mix	1279.5	7677.0	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
tetramethylammonium chloride	50	300	N/A	N/A	N/A

Irritation/Corrosion

SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
Frag/A-Tail Enzyme Mix Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Ligation Master Mix Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Amplification Master Mix Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Trometamol	Skin - Moderate irritant	Rabbit	-	25 %	-
	Skin - Severe irritant	Rabbit	-	500 mg	-

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Frag/A-Tail Buffer tetramethylammonium chloride	Category 1	oral	central nervous system (CNS)
Amplification Master Mix tetramethylammonium chloride	Category 1	oral	central nervous system (CNS)

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure

: Frag/A-Tail Buffer Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
 Frag/A-Tail Enzyme Mix Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
 Ligation Master Mix Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
 Amplification Master Mix Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation : Frag/A-Tail Buffer May cause damage to organs following a single exposure if inhaled.
 Frag/A-Tail Enzyme Mix No known significant effects or critical hazards.
 Ligation Master Mix No known significant effects or critical hazards.
 Amplification Master Mix May cause damage to organs following a single exposure if inhaled.

SECTION 11: Toxicological information

Ingestion	: Frag/A-Tail Buffer	Harmful if swallowed. May cause damage to organs following a single exposure if swallowed.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	Harmful if swallowed. May cause damage to organs following a single exposure if swallowed.
Skin contact	: Frag/A-Tail Buffer	May cause damage to organs following a single exposure in contact with skin.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	May cause damage to organs following a single exposure in contact with skin. Causes skin irritation.
Eye contact	: Frag/A-Tail Buffer	No known significant effects or critical hazards.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.
Ingestion	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.
Skin contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	Adverse symptoms may include the following: irritation redness
Eye contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	Adverse symptoms may include the following: pain or irritation watering redness

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Conclusion/Summary : Not available.

General	: Frag/A-Tail Buffer	No known significant effects or critical hazards.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	No known significant effects or critical hazards.

SECTION 11: Toxicological information

Carcinogenicity	: Frag/A-Tail Buffer	No known significant effects or critical hazards.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	No known significant effects or critical hazards.
Mutagenicity	: Frag/A-Tail Buffer	No known significant effects or critical hazards.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	No known significant effects or critical hazards.
Reproductive toxicity	: Frag/A-Tail Buffer	No known significant effects or critical hazards.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Frag/A-Tail Buffer Magnesium chloride	Acute EC50 >100 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
	Acute EC50 180000 µg/l Fresh water	Crustaceans - Calanoid copepod - <i>Eudiaptomus padanus ssp. padanus</i> - Adult	48 hours
	Acute IC50 6.8 mg/l Fresh water	Aquatic plants - Lesser Duckweed - <i>Lemna aequinoctialis</i>	96 hours
	Acute LC50 32000 µg/l Fresh water	Daphnia - Water flea - <i>Daphnia hyalina</i> - Adult	48 hours
	Acute LC50 2120 mg/l Fresh water	Fish - Fathead minnow - <i>Pimephales promelas</i>	96 hours
	Acute NOEC 100 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
	Chronic NOEC 0.1 mg/l Fresh water	Fish - common carp - <i>Cyprinus carpio</i>	35 days
tetramethylammonium chloride	Acute LC50 462 mg/l Fresh water	Fish - Fathead minnow - <i>Pimephales promelas</i>	96 hours
Frag/A-Tail Enzyme Mix Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Trout - <i>Oncorhynchus mykiss</i>	96 hours
Ligation Master Mix Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Trout - <i>Oncorhynchus mykiss</i>	96 hours
Amplification Master Mix Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Trout - <i>Oncorhynchus mykiss</i>	96 hours
Trometamol	Acute EC50 >980 mg/l Fresh water	Daphnia	48 hours
tetramethylammonium chloride	Acute NOEC 520 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 462 mg/l Fresh water	Fish - Fathead minnow - <i>Pimephales promelas</i>	96 hours

Conclusion/Summary : Not available.

12.2 Persistence and degradability

SECTION 12: Ecological information

Product/ingredient name	Test	Result	Dose	Inoculum
Frag/A-Tail Enzyme Mix Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Ligation Master Mix Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Amplification Master Mix Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Trometamol	OECD 301F Ready Biodegradability - Manometric Respirometry Test	97.1 % - Readily - 28 days	30 mg/l	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Frag/A-Tail Buffer tetramethylammonium chloride	-	-	Readily
Amplification Master Mix Trometamol	-	-	Readily
tetramethylammonium chloride	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Frag/A-Tail Buffer tetramethylammonium chloride	<-1.6	-	Low
Frag/A-Tail Enzyme Mix Glycerol	-1.76	-	Low
Ligation Master Mix Glycerol	-1.76	-	Low
Amplification Master Mix Glycerol	-1.76	-	Low
Trometamol	-2.31	-	Low
tetramethylammonium chloride	<-1.6	-	Low

12.4 Mobility in soil

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

Mobility : Not available.

SECTION 12: Ecological information

12.5 Results of PBT and vPvB assessment

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

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

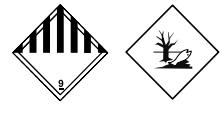
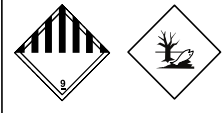
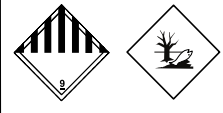
Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : 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 spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number	UN3082	UN3082	UN3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Magnesium chloride, tetramethylammonium chloride)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Magnesium chloride, tetramethylammonium chloride)	Environmentally hazardous substance, liquid, n.o.s. (Magnesium chloride, tetramethylammonium chloride)
14.3 Transport hazard class(es)	9 	9 	9 
14.4 Packing group	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.

Additional information

Remarks: De minimis quantities

ADR/RID : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

Hazard identification number 90

Limited quantity 5 L

Special provisions 274, 335, 601, 375

Tunnel code (-)

SECTION 14: Transport information

- IMDG** : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
Emergency schedules F-A, S-F
Special provisions 274, 335, 969
- IATA** : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.
Quantity limitation Passenger and Cargo Aircraft: 450 L. Packaging instructions: 964. Cargo Aircraft Only: 450 L. Packaging instructions: 964. Limited Quantities - Passenger Aircraft: 30 kg. Packaging instructions: Y964.
Special provisions A97, A158, A197, A215
- 14.6 Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
- 14.7 Transport in bulk according to IMO instruments** : Not available.

SECTION 15: Regulatory information

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

UK (GB)/REACH

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Ozone depleting substances

Not listed.

Prior Informed Consent (PIC)

Not listed.

Persistent Organic Pollutants

Not listed.

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

Product / Ingredient name	Identifiers	Status
Frag/A-Tail Buffer Frag/A-Tail Buffer	-	3
Amplification Master Mix Amplification Master Mix	-	3

- Label** : Frag/A-Tail Buffer Not applicable.
 Frag/A-Tail Enzyme Mix Not applicable.
 Ligation Master Mix Not applicable.
 Amplification Master Mix Not applicable.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

SECTION 15: Regulatory information

Category

Frag/A-Tail Buffer
E2

EU regulations

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

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

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

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

United States : Not determined.

SECTION 16: Other information

📌 Indicates information that has changed from previously issued version.

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

Procedure used to derive the classification

Classification	Justification
Frag/A-Tail Buffer Acute Tox. 4, H302 STOT SE 2, H371 Aquatic Chronic 2, H411	Calculation method Calculation method Calculation method
Amplification Master Mix Acute Tox. 4, H302 Skin Irrit. 2, H315 STOT SE 2, H371 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method Calculation method

SECTION 16: Other information

[Full text of abbreviated H statements](#)

Frag/A-Tail

Buffer

H300	Fatal if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H370	Causes damage to organs.
H371	May cause damage to organs.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Amplification

Master Mix

H300	Fatal if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H370	Causes damage to organs.
H371	May cause damage to organs.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

[Full text of classifications](#)

Frag/A-Tail Buffer

Acute Tox. 2	ACUTE TOXICITY - Category 2
Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Chronic 1	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT SE 1	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 1
STOT SE 2	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 2

Amplification

Master Mix

Acute Tox. 2	ACUTE TOXICITY - Category 2
Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT SE 1	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 1
STOT SE 2	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 2

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Version : 1.1

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