

SAFETY DATA SHEET



SureGuide Cas9 Programmable Nuclease Kit - 100 Reactions, Part Number 5190-7716

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

1.1 Product identifier

Product name	: SureGuide Cas9 Programmable Nuclease Kit - 100 Reactions, Part Number 5190-7716		
CAS number	: RNase Free Water	7732-18-5	
	: Control DNA Target	Not applicable.	
	: 10X Cas9 Digestion Buffer	Not applicable.	
	: Cas9 Nuclease	Not applicable.	
	: Control gRNA	Not applicable.	
Part no. (chemical kit)	: 5190-7716		
Part no.	: RNase Free Water	740000-42	
	: Control DNA Target	5190-7536	
	: 10X Cas9 Digestion Buffer	5190-7540	
	: Cas9 Nuclease	5190-7541	
	: Control gRNA	5190-7539	

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

Identified uses	: Analytical reagent.		
	: RNase Free Water	1.5 ml	
	: Control DNA Target	0.02 ml (20 µl 50 ng/µl)	
	: 10X Cas9 Digestion Buffer	0.2 ml	
	: Cas9 Nuclease	0.1 ml (100 reactions)	
	: Control gRNA	0.01 ml (10 µl 1 µM)	
Uses advised against	: None known.		

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
 Hewlett-Packard-Str. 8
 76337 Waldbronn
 Germany
 0800 603 1000
e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition	: RNase Free Water	Mono-constituent substance
	: Control DNA Target	Mixture
	: 10X Cas9 Digestion Buffer	Mixture
	: Cas9 Nuclease	Mixture
	: Control gRNA	Mixture

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

Cas9 Nuclease
 H317 SKIN SENSITISATION Category 1

SECTION 2: Hazards identification

RNase Free Water	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Control DNA Target	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
10X Cas9 Digestion Buffer	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Cas9 Nuclease	The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Control gRNA	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Ingredients of unknown toxicity	: 10X Cas9 Digestion Buffer	Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%
	Cas9 Nuclease	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: 30 - 60%

Ingredients of unknown ecotoxicity	: 10X Cas9 Digestion Buffer	Contains 3% of components with unknown hazards to the aquatic environment
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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 : Cas9 Nuclease



Signal word	: RNase Free Water	No signal word.
	Control DNA Target	No signal word.
	10X Cas9 Digestion Buffer	No signal word.
	Cas9 Nuclease	Warning
	Control gRNA	No signal word.

Hazard statements	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	H317 - May cause an allergic skin reaction.
	Control gRNA	No known significant effects or critical hazards.

Precautionary statements

Prevention	: RNase Free Water	Not applicable.
	Control DNA Target	Not applicable.
	10X Cas9 Digestion Buffer	Not applicable.
	Cas9 Nuclease	P280 - Wear protective gloves. P261 - Avoid breathing vapour.
	Control gRNA	Not applicable.

Response	: RNase Free Water	Not applicable.
	Control DNA Target	Not applicable.
	10X Cas9 Digestion Buffer	Not applicable.
	Cas9 Nuclease	P362 + P364 - Take off contaminated clothing and wash it before reuse. P302 + P352 - IF ON SKIN: Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.
	Control gRNA	Not applicable.

SECTION 2: Hazards identification

Storage	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Disposal	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	Not applicable. Not applicable. Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable.
Hazardous ingredients	: Cas9 Nuclease	2-mercaptoethanol
Supplemental label elements	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	Not applicable. Not applicable. Contains 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated. May produce an allergic reaction. Safety data sheet available on request. Not applicable. Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
<u>Special packaging requirements</u>		
Tactile warning of danger	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	Not applicable. 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

PBT	P	B	T	vPvB	vP	vB
RNase Free Water						
Not applicable (Inorganic)	N/A	N/A	N/A	Not applicable (Inorganic)	N/A	N/A

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

10X Cas9 Digestion Buffer This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Cas9 Nuclease This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Control gRNA 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	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	None known. None known. None known. None known. None known.
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SECTION 3: Composition/information on ingredients

3.1 Substances : RNase Free Water Mono-constituent substance
 Control DNA Target Mixture
 10X Cas9 Digestion Buffer Mixture
 Cas9 Nuclease Mixture
 Control gRNA Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
RNase Free Water water	REACH #: Annex IV EC: 231-791-2 CAS: 7732-18-5	100	Not classified.	-	[1]
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	EC: 500-022-5 CAS: 9014-85-1	≤0.3	Eye Dam. 1, H318 Skin Sens. 1B, H317 Aquatic Chronic 3, H412	-	[1]
Cas9 Nuclease glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	-	[2]
2-mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤0.3	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 3, H331 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1A, H317 Repr. 2, H361f STOT RE 2, H373 (heart, liver) Aquatic Acute 1, H400 Aquatic Chronic 2, H411	ATE [Oral] = 244 mg/kg ATE [Dermal] = 200 mg/kg ATE [Inhalation (vapours)] = 3 mg/l M [Acute] = 1	[1]
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	CAS: 9036-19-5	<0.1	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 See Section 16 for the full text of the H statements declared above.	ATE [Oral] = 500 mg/kg M [Acute] = 10 M [Chronic] = 1	[1] [3]

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
 RNase Free Water [1] Constituent
 10X Cas9 Digestion Buffer [1] Substance classified with a health or environmental hazard
 Cas9 Nuclease [1] Substance classified with a health or environmental hazard
 [2] Substance with a workplace exposure limit
 [3] Substance of equivalent concern

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: RNase Free Water	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	Control DNA Target	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	10X Cas9 Digestion Buffer	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.
	Cas9 Nuclease	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 irritation occurs.
	Control gRNA	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Inhalation	: RNase Free Water	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	Control DNA Target	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	10X Cas9 Digestion Buffer	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	Cas9 Nuclease	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.
	Control gRNA	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Skin contact	: RNase Free Water	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Control DNA Target	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	10X Cas9 Digestion Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Cas9 Nuclease	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. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	Control gRNA	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

SECTION 4: First aid measures

Ingestion	: RNase Free Water	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	Control DNA Target	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	10X Cas9 Digestion Buffer	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	Cas9 Nuclease	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	Control gRNA	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	: RNase Free Water	No action shall be taken involving any personal risk or without suitable training.
	Control DNA Target	No action shall be taken involving any personal risk or without suitable training.
	10X Cas9 Digestion Buffer	No action shall be taken involving any personal risk or without suitable training.
	Cas9 Nuclease	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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
	Control gRNA	No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	No known significant effects or critical hazards.
	Control gRNA	No known significant effects or critical hazards.
Inhalation	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	No known significant effects or critical hazards.
	Control gRNA	No known significant effects or critical hazards.

SECTION 4: First aid measures

Skin contact	:	RNase Free Water	No known significant effects or critical hazards.
		Control DNA Target	No known significant effects or critical hazards.
		10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
		Cas9 Nuclease	May cause an allergic skin reaction.
		Control gRNA	No known significant effects or critical hazards.
Ingestion	:	RNase Free Water	No known significant effects or critical hazards.
		Control DNA Target	No known significant effects or critical hazards.
		10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
		Cas9 Nuclease	No known significant effects or critical hazards.
		Control gRNA	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	:	RNase Free Water	No specific data.
		Control DNA Target	No specific data.
		10X Cas9 Digestion Buffer	No specific data.
		Cas9 Nuclease	No specific data.
		Control gRNA	No specific data.
Inhalation	:	RNase Free Water	No specific data.
		Control DNA Target	No specific data.
		10X Cas9 Digestion Buffer	No specific data.
		Cas9 Nuclease	No specific data.
		Control gRNA	No specific data.
Skin contact	:	RNase Free Water	No specific data.
		Control DNA Target	No specific data.
		10X Cas9 Digestion Buffer	No specific data.
		Cas9 Nuclease	Adverse symptoms may include the following: irritation redness
		Control gRNA	No specific data.
Ingestion	:	RNase Free Water	No specific data.
		Control DNA Target	No specific data.
		10X Cas9 Digestion Buffer	No specific data.
		Cas9 Nuclease	No specific data.
		Control gRNA	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	:	RNase Free Water	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Control DNA Target	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		10X Cas9 Digestion 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.
		Cas9 Nuclease	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		Control gRNA	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	RNase Free Water	No specific treatment.
		Control DNA Target	No specific treatment.
		10X Cas9 Digestion Buffer	No specific treatment.
		Cas9 Nuclease	No specific treatment.
		Control gRNA	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	None known. None known. None known. None known. None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous combustion products	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	No specific data. No specific data. Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds metal oxide/oxides Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds metal oxide/oxides No specific data.

5.3 Advice for firefighters

Special precautions for fire-fighters	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	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. 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. 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. 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. 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.
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SECTION 5: Firefighting measures

Special protective equipment for fire-fighters

: RNase Free Water	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Control DNA Target	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
10X Cas9 Digestion Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Cas9 Nuclease	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Control gRNA	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: RNase Free Water	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
Control DNA Target	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
10X Cas9 Digestion 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. Put on appropriate personal protective equipment.
Cas9 Nuclease	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.
Control gRNA	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.

SECTION 6: Accidental release measures

For emergency responders

: RNase Free Water	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Control DNA Target	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
10X Cas9 Digestion 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".
Cas9 Nuclease	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Control gRNA	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

: RNase Free Water	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Control DNA Target	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
10X Cas9 Digestion 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).
Cas9 Nuclease	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Control gRNA	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Methods for cleaning up

: RNase Free Water	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Control DNA Target	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 Cas9 Digestion 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.
Cas9 Nuclease	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

Control gRNA	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.
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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	: RNase Free Water	Put on appropriate personal protective equipment (see Section 8).
	Control DNA Target	Put on appropriate personal protective equipment (see Section 8).
	10X Cas9 Digestion Buffer	Put on appropriate personal protective equipment (see Section 8).
	Cas9 Nuclease	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 ingest. Avoid breathing vapour 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.
	Control gRNA	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	: RNase Free Water	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	Control DNA Target	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 Cas9 Digestion 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.
	Cas9 Nuclease	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	Control gRNA	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

SECTION 7: Handling and storage

Storage

: RNase Free Water	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Control DNA Target	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
10X Cas9 Digestion Buffer	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Cas9 Nuclease	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Control gRNA	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

Recommendations

: RNase Free Water	Industrial applications, Professional applications.
Control DNA Target	Industrial applications, Professional applications.
10X Cas9 Digestion Buffer	Industrial applications, Professional applications.
Cas9 Nuclease	Industrial applications, Professional applications.
Control gRNA	Industrial applications, Professional applications.

SECTION 7: Handling and storage

Industrial sector specific solutions	: RNase Free Water	Not available.
	Control DNA Target	Not available.
	10X Cas9 Digestion	Not available.
	Buffer	
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Cas9 Nuclease Glycerol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 10 mg/m ³ 8 hours. Form: mist

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	DNEL	Long term Oral	0.307 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.307 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	0.534 mg/m ³	General population	Systemic
	DNEL	Long term Dermal	0.859 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	3.03 mg/m ³	Workers	Systemic
Cas9 Nuclease 2-Mercaptoethanol	DNEL	Short term Oral	0.025 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.025 mg/kg bw/day	General population	Systemic
	DNEL	Short term Dermal	0.05 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Dermal	0.05 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	0.17 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	0.17 mg/m ³	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Individual protection measures

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

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

Skin protection

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

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

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

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

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

SECTION 9: Physical and chemical properties

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state	: RNase Free Water	Liquid.
	Control DNA Target	Liquid.
	10X Cas9 Digestion Buffer	Liquid.
	Cas9 Nuclease	Liquid.
	Control gRNA	Liquid.
Colour	: RNase Free Water	Colourless.
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.
Odour	: RNase Free Water	Odourless.
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

SECTION 9: Physical and chemical properties

Odour threshold : RNase Free Water Not available.
 Control DNA Target Not available.
 10X Cas9 Digestion Not available.
 Buffer
 Cas9 Nuclease Not available.
 Control gRNA Not available.

Melting point/freezing point : RNase Free Water 0°C
 Control DNA Target 0°C
 10X Cas9 Digestion Not available.
 Buffer
 Cas9 Nuclease Not available.
 Control gRNA 0°C

Initial boiling point and boiling range : RNase Free Water 100°C
 Control DNA Target 100°C
 10X Cas9 Digestion Not available.
 Buffer
 Cas9 Nuclease Not available.
 Control gRNA 100°C

Flammability : RNase Free Water Not applicable.
 Control DNA Target Not applicable.
 10X Cas9 Digestion Not applicable.
 Buffer
 Cas9 Nuclease Not applicable.
 Control gRNA Not applicable.

Upper/lower flammability or explosive limits : RNase Free Water Not available.
 Control DNA Target Not available.
 10X Cas9 Digestion Not available.
 Buffer
 Cas9 Nuclease Not available.
 Control gRNA Not available.

Flash point :

Ingredient name	Closed cup		Open cup	
	°C	Method	°C	Method
Cas9 Nuclease				
glycerol	-	-	177	-

Auto-ignition temperature : RNase Free Water Not applicable.

Ingredient name	°C	Method
Cas9 Nuclease		
glycerol	370	-

Decomposition temperature : RNase Free Water Not available.
 Control DNA Target Not available.
 10X Cas9 Digestion Not available.
 Buffer
 Cas9 Nuclease Not available.
 Control gRNA Not available.

pH : RNase Free Water 7
 Control DNA Target 8
 10X Cas9 Digestion 7
 Buffer
 Cas9 Nuclease 7
 Control gRNA 7

Viscosity : RNase Free Water Not available.
 Control DNA Target Not available.
 10X Cas9 Digestion Not available.
 Buffer
 Cas9 Nuclease Not available.
 Control gRNA Not available.

SECTION 9: Physical and chemical properties

Solubility(ies)	Media	Result
	RNase Free Water water	Soluble
	Control DNA Target water	Soluble
	10X Cas9 Digestion Buffer water	Soluble
	Cas9 Nuclease water	Soluble
	Control gRNA water	Soluble

Partition coefficient: n-octanol/water		
	RNase Free Water	-1.38
	Control DNA Target	Not applicable.
	10X Cas9 Digestion Buffer	Not applicable.
	Cas9 Nuclease	Not applicable.
	Control gRNA	Not applicable.

Vapour pressure		
	RNase Free Water	2.3 kPa (17.5 mm Hg) [room temperature] 12.3 kPa (92.258 mm Hg) [50°C]

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Control DNA Target water	17.5	2.3	-	92.258	12.3	-
10X Cas9 Digestion Buffer water	17.5	2.3	-	92.258	12.3	-
Cas9 Nuclease water	17.5	2.3	-	92.258	12.3	-
glycerol	0.000075	0.00001	-	0.0025	0.00033	-
Control gRNA water	17.5	2.3	-	92.258	12.3	-

Evaporation rate		
	RNase Free Water	Not available.
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

Relative density		
	RNase Free Water	1
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

SECTION 9: Physical and chemical properties

Vapour density	: RNase Free Water	0.62 [Air = 1]
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

Explosive properties	: RNase Free Water	Not available.
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

Oxidising properties	: RNase Free Water	Not available.
	Control DNA Target	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
	Control gRNA	Not available.

Particle characteristics

Median particle size	: RNase Free Water	Not applicable.
	Control DNA Target	Not applicable.
	10X Cas9 Digestion Buffer	Not applicable.
	Cas9 Nuclease	Not applicable.
	Control gRNA	Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: RNase Free Water	No specific test data related to reactivity available for this product or its ingredients.
	Control DNA Target	No specific test data related to reactivity available for this product or its ingredients.
	10X Cas9 Digestion Buffer	No specific test data related to reactivity available for this product or its ingredients.
	Cas9 Nuclease	No specific test data related to reactivity available for this product or its ingredients.
	Control gRNA	No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability	: RNase Free Water	The product is stable.
	Control DNA Target	The product is stable.
	10X Cas9 Digestion Buffer	The product is stable.
	Cas9 Nuclease	The product is stable.
	Control gRNA	The product is stable.

10.3 Possibility of hazardous reactions	: RNase Free Water	Under normal conditions of storage and use, hazardous reactions will not occur.
	Control DNA Target	Under normal conditions of storage and use, hazardous reactions will not occur.
	10X Cas9 Digestion Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
	Cas9 Nuclease	Under normal conditions of storage and use, hazardous reactions will not occur.
	Control gRNA	Under normal conditions of storage and use, hazardous reactions will not occur.

SECTION 10: Stability and reactivity

10.4 Conditions to avoid	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	No specific data. No specific data. No specific data. No specific data. No specific data. No specific data.
10.5 Incompatible materials	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	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. 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.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
Cas9 Nuclease 2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	LD50 Oral	Rat	2800 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)
Cas9 Nuclease Cas9 Nuclease	152500.0	125000	N/A	871.1	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	500	N/A	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Cas9 Nuclease 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Eyes - Severe irritant	Rabbit	-	1 %	-

SECTION 11: Toxicological information

Sensitiser

Skin : CAS9 Nuclease: May cause skin sensitisation.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Cas9 Nuclease 2-Mercaptoethanol	Category 2	-	heart, liver

Aspiration hazard

Not available.

Information on likely routes of exposure

RNase Free Water	Not available.
Control DNA Target	Not available.
10X Cas9 Digestion Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
Cas9 Nuclease	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
Control gRNA	Not available.

Potential acute health effects

Inhalation	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	No known significant effects or critical hazards.
	Control gRNA	No known significant effects or critical hazards.
Ingestion	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	No known significant effects or critical hazards.
	Control gRNA	No known significant effects or critical hazards.
Skin contact	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	May cause an allergic skin reaction.
	Control gRNA	No known significant effects or critical hazards.
Eye contact	: RNase Free Water	No known significant effects or critical hazards.
	Control DNA Target	No known significant effects or critical hazards.
	10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
	Cas9 Nuclease	No known significant effects or critical hazards.
	Control gRNA	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

SECTION 11: Toxicological information

Inhalation	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	No specific data. No specific data. No specific data. No specific data. No specific data.
Ingestion	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	No specific data. No specific data. No specific data. No specific data. No specific data.
Skin contact	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	No specific data. No specific data. No specific data. Adverse symptoms may include the following: irritation redness No specific data.
Eye contact	: RNase Free Water Control DNA Target 10X Cas9 Digestion Buffer Cas9 Nuclease Control gRNA	No specific data. No specific data. No specific data. No specific data. No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Conclusion/Summary : Not available.

General : RNase Free Water No known significant effects or critical hazards.
Control DNA Target No known significant effects or critical hazards.
10X Cas9 Digestion Buffer No known significant effects or critical hazards.
Cas9 Nuclease Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Control gRNA No known significant effects or critical hazards.

Carcinogenicity : RNase Free Water No known significant effects or critical hazards.
Control DNA Target No known significant effects or critical hazards.
10X Cas9 Digestion Buffer No known significant effects or critical hazards.
Cas9 Nuclease No known significant effects or critical hazards.
Control gRNA No known significant effects or critical hazards.

Mutagenicity : RNase Free Water No known significant effects or critical hazards.
Control DNA Target No known significant effects or critical hazards.
10X Cas9 Digestion Buffer No known significant effects or critical hazards.
Cas9 Nuclease No known significant effects or critical hazards.
Control gRNA No known significant effects or critical hazards.

SECTION 11: Toxicological information

Reproductive toxicity	:	RNase Free Water	No known significant effects or critical hazards.
		Control DNA Target	No known significant effects or critical hazards.
		10X Cas9 Digestion Buffer	No known significant effects or critical hazards.
		Cas9 Nuclease	No known significant effects or critical hazards.
		Control gRNA	No known significant effects or critical hazards.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	Acute EC50 82 mg/l Fresh water	Algae - <i>Pseudokirchneriella subcapitata</i>	72 hours
	Acute EC50 91 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 42 mg/l Fresh water	Fish - <i>Cyprinus carpio</i>	96 hours
	Acute NOEC 43 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute NOEC 10 mg/l Fresh water	Fish - <i>Cyprinus carpio</i>	96 hours
Cas9 Nuclease 2-Mercaptoethanol Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Acute EC50 0.4 mg/l Fresh water	Daphnia	48 hours
	Acute EC50 210 µg/l Fresh water	Algae - <i>Selenastrum sp.</i>	96 hours
	Acute LC50 10800 µg/l Marine water	Crustaceans - <i>Pandalus montagui</i> - Adult	48 hours
	Acute LC50 2.518 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 7200 µg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	OECD 302B Inherent Biodegradability: Zahn-Wellens/ EMPA Test	6 % - Not readily - 28 days	-	-
Cas9 Nuclease 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-

SECTION 12: Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
RNase Free Water water	-	-	Readily
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	-	-	Not readily
Cas9 Nuclease 2-Mercaptoethanol	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
RNase Free Water water	-1.38	-	Low
10X Cas9 Digestion Buffer 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated	1.8 to 2.5	-	Low
Cas9 Nuclease 2-Mercaptoethanol Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	-0.056 2.7	- 78.67	Low Low

12.4 Mobility in soil

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

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
RNase Free Water water	Not applicable (Inorganic)	N/A	N/A	N/A	Not applicable (Inorganic)	N/A	N/A

12.6 Endocrine disrupting properties

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

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

SECTION 13: Disposal considerations

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

Packaging

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

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

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number or ID number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-
14.5 Environmental hazards	No.	No.	No.

Additional information

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

14.7 Transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

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

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

Annex XIV - List of substances subject to authorisation

Annex XIV

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
Cas9 Nuclease Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.- hydroxy-	Endocrine disrupting properties for environment	Listed	42	7/3/2017

Substances of very high concern

SECTION 15: Regulatory information

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
Cas9 Nuclease Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.- hydroxy-	Endocrine disrupting properties for environment	Recommended	ED/169/2012	7/3/2017

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

Product / Ingredient name	Identifiers	Designation [Usage]
Cas9 Nuclease Cas9 Nuclease		3

Label	: RNase Free Water	Not applicable.
	: Control DNA Target	Not applicable.
	: 10X Cas9 Digestion Buffer	Not applicable.
	: Cas9 Nuclease	Not applicable.
	: Control gRNA	Not applicable.

Other EU regulations

Ozone depleting substances (1005/2009/EU)

Not listed.

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

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	: Not determined.
Canada	: Not determined.
China	: Not determined.
Eurasian Economic Union	: Russian Federation inventory: Not determined.
Japan	: Japan inventory (CSCL): Not determined. Japan inventory (ISHL): Not determined.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: Not determined.
Taiwan	: All components are listed or exempted.

SECTION 15: Regulatory information

Thailand	: Not determined.
Turkey	: Not determined.
United States	: All components are active or exempted.
Viet Nam	: Not determined.

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

SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms :

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

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Cas9 Nuclease Skin Sens. 1, H317	Calculation method

Full text of abbreviated H statements

<p>10X Cas9 Digestion Buffer</p> <p>H317 H318 H412</p> <p>Cas9 Nuclease</p> <p>H301 H302 H310 H315 H317 H318 H331 H361f H373</p> <p>H400 H410 H411</p>	<p>May cause an allergic skin reaction. Causes serious eye damage. Harmful to aquatic life with long lasting effects.</p> <p>Toxic if swallowed. Harmful if swallowed. Fatal in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Toxic if inhaled. Suspected of damaging fertility. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects. Toxic to aquatic life with long lasting effects.</p>
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Full text of classifications [CLP/GHS]

<p>10X Cas9 Digestion Buffer</p> <p>Aquatic Chronic 3 Eye Dam. 1 Skin Sens. 1B</p> <p>Cas9 Nuclease</p> <p>Acute Tox. 2 Acute Tox. 3 Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2</p>	<p>LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SKIN SENSITISATION - Category 1B</p> <p>ACUTE TOXICITY - Category 2 ACUTE TOXICITY - Category 3 ACUTE TOXICITY - Category 4 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2</p>
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SECTION 16: Other information

Eye Dam. 1 Repr. 2 Skin Irrit. 2 Skin Sens. 1 Skin Sens. 1A STOT RE 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 REPRODUCTIVE TOXICITY - Category 2 SKIN CORROSION/IRRITATION - Category 2 SKIN SENSITISATION - Category 1 SKIN SENSITISATION - Category 1A SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
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