# SAFETY DATA SHEET

Agilent Technologies

SureGuide Cas9 Programmable Nuclease Kit - 20 Reactions, Part Number 5190-7715

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

### 1.1 Product identifier

**Product name** : SureGuide Cas9 Programmable Nuclease Kit - 20 Reactions, Part Number 5190-7715

**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)** : 5190-7715

**Part no.** :

| | |
|---|---|
| RNase Free Water | 740000-42 |
| Control DNA Target | 5190-7536 |
| 10X Cas9 Digestion Buffer | 5190-7537 |
| Cas9 Nuclease | 5190-7538 |
| 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 | 0.022 ml (20 µl 50 ng/ µl) |
| 10X Cas9 Digestion Buffer | 0.04 ml |
| Cas9 Nuclease | 0.02 ml (20 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

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.<br>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.<br>P302 + P352 - IF ON SKIN: Wash with plenty of water.<br>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 | Not applicable. |
| | | Control DNA Target | Not applicable. |
| | | 10X Cas9 Digestion Buffer | Not applicable. |
| | | Cas9 Nuclease | Not applicable. |
| | | Control gRNA | Not applicable. |
| **Disposal** | : | RNase Free Water | Not applicable. |
| | | Control DNA Target | Not applicable. |
| | | 10X Cas9 Digestion Buffer | Not applicable. |
| | | Cas9 Nuclease | P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| | | Control gRNA | Not applicable. |
| **Hazardous ingredients** | : | Cas9 Nuclease | 2-mercaptoethanol |
| **Supplemental label elements** | : | RNase Free Water | Not applicable. |
| | | Control DNA Target | Not applicable. |
| | | 10X Cas9 Digestion Buffer | Contains 2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated. May produce an allergic reaction. Safety data sheet available on request. |
| | | Cas9 Nuclease | Not applicable. |
| | | Control gRNA | Not applicable. |
| **Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** | : | RNase Free Water | Not applicable. |
| | | Control DNA Target | Not applicable. |
| | | 10X Cas9 Digestion Buffer | Not applicable. |
| | | Cas9 Nuclease | Not applicable. |
| | | Control gRNA | Not applicable. |
| **Special packaging requirements** | | | |
| **Tactile warning of danger** | : | RNase Free Water | Not applicable. |
| | | Control DNA Target | Not applicable. |
| | | 10X Cas9 Digestion Buffer | Not applicable. |
| | | Cas9 Nuclease | Not applicable. |
| | | Control gRNA | 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 | None known. |
| | | Control DNA Target | None known. |
| | | 10X Cas9 Digestion Buffer | None known. |
| | | Cas9 Nuclease | None known. |
| | | Control gRNA | None known. |

## 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<br>EC: 231-791-2<br>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<br>CAS: 9014-85-1 | ≤0.3 | Eye Dam. 1, H318<br>Skin Sens. 1B, H317<br>Aquatic Chronic 3, H412 | - | [1] |
| **Cas9 Nuclease** | | | | | |
| glycerol | REACH #: Annex V<br>EC: 200-289-5<br>CAS: 56-81-5 | ≥50 - ≤75 | Not classified. | - | [2] |
| 2-mercaptoethanol | EC: 200-464-6<br>CAS: 60-24-2 | ≤0.3 | Acute Tox. 3, H301<br>Acute Tox. 2, H310<br>Acute Tox. 3, H331<br>Skin Irrit. 2, H315<br>Eye Dam. 1, H318<br>Skin Sens. 1A, H317<br>Repr. 2, H361f<br>STOT RE 2, H373 (heart, liver)<br>Aquatic Acute 1, H400<br>Aquatic Chronic 2, H411 | ATE [Oral] = 244 mg/kg<br>ATE [Dermal] = 200 mg/kg<br>ATE [Inhalation (vapours)] = 3 mg/l<br>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<br>Skin Irrit. 2, H315<br>Eye Dam. 1, H318<br>Aquatic Acute 1, H400<br>Aquatic Chronic 1, H410<br>**See Section 16 for the full text of the H statements declared above.** | ATE [Oral] = 500 mg/kg<br>M [Acute] = 10<br>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:<br>irritation<br>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 | Use an extinguishing agent suitable for the surrounding fire. |
| | Control DNA Target | Use an extinguishing agent suitable for the surrounding fire. |
| | 10X Cas9 Digestion Buffer | Use an extinguishing agent suitable for the surrounding fire. |
| | Cas9 Nuclease | Use an extinguishing agent suitable for the surrounding fire. |
| | Control gRNA | Use an extinguishing agent suitable for the surrounding fire. |
| **Unsuitable extinguishing media** : | RNase Free Water | None known. |
| | Control DNA Target | None known. |
| | 10X Cas9 Digestion Buffer | None known. |
| | Cas9 Nuclease | None known. |
| | Control gRNA | None known. |

## 5.2 Special hazards arising from the substance or mixture

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

## 5.3 Advice for firefighters

| | | |
|---|---|---|
| **Special precautions for fire-fighters** : | RNase Free Water | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| | Control DNA Target | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| | 10X Cas9 Digestion 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. |
| | Cas9 Nuclease | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| | Control 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. |

## 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. |

**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 Buffer | Not available. |
| 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**<br>Glycerol | **NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)**<br>OELV: 10 mg/m³ 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/m³ | General population | Systemic |
| | DNEL | Long term Dermal | 0.859 mg/kg bw/day | Workers | Systemic |
| | DNEL | Long term Inhalation | 3.03 mg/m³ | 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/m³ | Workers | Systemic |
| | DNEL | Long term Inhalation | 0.17 mg/m³ | 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 Buffer | Not available. |
| 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 Buffer | Not available. |
| 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 Buffer | Not available. |
| Cas9 Nuclease | Not available. |
| Control gRNA | 100°C |

**Flammability** :

| | |
|---|---|
| RNase Free Water | Not applicable. |
| Control DNA Target | Not applicable. |
| 10X Cas9 Digestion Buffer | Not applicable. |
| 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 Buffer | Not available. |
| Cas9 Nuclease | Not available. |
| Control gRNA | Not available. |

**Flash point** :

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

**Auto-ignition temperature** :

| Ingredient name | °C | Method |
|---|---|---|
| **Cas9 Nuclease** | | |
| glycerol | 370 | - |

**Decomposition temperature** :

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

**pH** :

| | |
|---|---|
| RNase Free Water | 7 |
| Control DNA Target | 8 |
| 10X Cas9 Digestion Buffer | 7 |
| Cas9 Nuclease | 7 |
| Control gRNA | 7 |

**Viscosity** :

| | |
|---|---|
| RNase Free Water | Not available. |
| 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

**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 | 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. |

**10.5 Incompatible materials** :

| | |
|---|---|
| RNase Free Water | May react or be incompatible with oxidising materials. |
| Control DNA Target | May react or be incompatible with oxidising materials. |
| 10X Cas9 Digestion Buffer | May react or be incompatible with oxidising materials. |
| Cas9 Nuclease | May react or be incompatible with oxidising materials. |
| Control gRNA | May react or be incompatible with oxidising materials. |

**10.6 Hazardous decomposition products** :

| | |
|---|---|
| RNase Free Water | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| Control DNA Target | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| 10X Cas9 Digestion Buffer | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| Cas9 Nuclease | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| Control gRNA | 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**

**Conclusion/Summary** : Not available.

**Mutagenicity**

**Conclusion/Summary** : Not available.

**Carcinogenicity**

**Conclusion/Summary** : Not available.

**Reproductive toxicity**

**Conclusion/Summary** : Not available.

**Teratogenicity**

**Conclusion/Summary** : Not available.

**Specific target organ toxicity (single exposure)**

Not available.

**Specific target organ toxicity (repeated exposure)**

| Product/ingredient name | Category | Route of exposure | Target organs |
|---|---|---|---|
| **Cas9 Nuclease**<br>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 | 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. |
| **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. |
| **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:<br>irritation<br>redness |
| | | Control gRNA | No specific data. |
| **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. |

**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 - *Pseudokirchneriella subcapitata* | 72 hours |
| | Acute EC50 91 mg/l Fresh water | Daphnia - *Daphnia magna* | 48 hours |
| | Acute LC50 42 mg/l Fresh water | Fish - *Cyprinus carpio* | 96 hours |
| | Acute NOEC 43 mg/l Fresh water | Daphnia - *Daphnia magna* | 48 hours |
| | Acute NOEC 10 mg/l Fresh water | Fish - *Cyprinus carpio* | 96 hours |
| **Cas9 Nuclease** | | | |
| 2-Mercaptoethanol | Acute EC50 0.4 mg/l Fresh water | Daphnia | 48 hours |
| Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy- | Acute EC50 210 µg/l Fresh water | Algae - *Selenastrum sp.* | 96 hours |
| | Acute LC50 10800 µg/l Marine water | Crustaceans - *Pandalus montagui* - Adult | 48 hours |
| | Acute LC50 2.518 mg/l Fresh water | Daphnia - *Daphnia magna* | 48 hours |
| | Acute LC50 7200 µg/l Fresh water | Fish - *Oncorhynchus mykiss* | 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**<br>water | - | - | Readily |
| **10X Cas9 Digestion Buffer**<br>2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated | - | - | Not readily |
| **Cas9 Nuclease**<br>2-Mercaptoethanol | - | - | Not readily |

### 12.3 Bioaccumulative potential

| Product/ingredient name | $LogP_{ow}$ | BCF | Potential |
|---|---|---|---|
| **RNase Free Water**<br>water | -1.38 | - | Low |
| **10X Cas9 Digestion Buffer**<br>2,4,7,9-Tetramethyldec-5-yne-4,7-diol, ethoxylated | 1.8 to 2.5 | - | Low |
| **Cas9 Nuclease**<br>2-Mercaptoethanol<br>Poly(oxy-1,2-ethanediyl), . alpha.-[(1,1,3,3-tetramethylbutyl) phenyl]-.omega.-hydroxy- | -0.056<br>2.7 | -<br>78.67 | Low<br>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**<br>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**<br>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**<br>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**<br>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** : All components are listed or exempted.

**Eurasian Economic Union** : **Russian Federation inventory**: Not determined.

**Japan** : **Japan inventory (CSCL)**: Not determined.
**Japan inventory (ISHL)**: All components are listed or exempted.

**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**<br>Skin Sens. 1, H317 | Calculation method |

**Full text of abbreviated H statements**

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

**Full text of classifications [CLP/GHS]**

| | |
|---|---|
| **10X Cas9 Digestion Buffer** | |
| Aquatic Chronic 3 | LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 |
| Eye Dam. 1 | SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 |
| Skin Sens. 1B | SKIN SENSITISATION - Category 1B |
| **Cas9 Nuclease** | |
| Acute Tox. 2 | ACUTE TOXICITY - Category 2 |
| Acute Tox. 3 | ACUTE TOXICITY - Category 3 |
| Acute Tox. 4 | ACUTE TOXICITY - Category 4 |
| Aquatic Acute 1 | SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 |
| Aquatic Chronic 1 | LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 |
| Aquatic Chronic 2 | LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2 |

## SECTION 16: Other information

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

**Date of issue/ Date of revision** : 28/02/2024

**Date of previous issue** : No previous validation

**Version** : 1

**Notice to reader**

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