

# SAFETY DATA SHEET

SureGuide Cas9 Nuclease and Buffer - 100 Reactions, Part Number 5190-7717

## Section 1. Identification

### 1.1 Product identifier

**Product name** : SureGuide Cas9 Nuclease and Buffer - 100 Reactions, Part Number 5190-7717

**Part no. (chemical kit)** : 5190-7717

**Part no.** :  RNase Free Water 740000-42  
 10X Cas9 Digestion Buffer 5190-7540  
 Cas9 Nuclease 5190-7541

**Validation date** : 11/16/2018

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

**Material uses** : Analytical reagent.

RNase Free Water 2 x 1.5 ml  
 10X Cas9 Digestion Buffer 0.2 ml  
 Cas9 Nuclease 0.1 ml (100 reactions)

### 1.3 Details of the supplier of the safety data sheet

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

### 1.4 Emergency telephone number

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

## Section 2. Hazards identification

### 2.1 Classification of the substance or mixture

<b>OSHA/HCS status</b>	: <input checked="" type="checkbox"/> RNase Free Water	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
	10X Cas9 Digestion Buffer	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
	Cas9 Nuclease	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### Classification of the substance or mixture


**10X Cas9 Digestion Buffer**

H315 SKIN IRRITATION - Category 2  
 H319 EYE IRRITATION - Category 2A

**Cas9 Nuclease**

H320 EYE IRRITATION - Category 2B  
 H317 SKIN SENSITIZATION - Category 1

## Section 2. Hazards identification

<b>Ingredients of unknown toxicity</b>	<p>10X Cas9 Digestion Buffer</p> <p>Cas9 Nuclease</p> <p>10X Cas9 Digestion Buffer</p>	<p>Percentage of the mixture consisting of ingredient (s) of unknown dermal toxicity: 10 - 30%</p> <p>Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 10 - 30%</p> <p>Percentage of the mixture consisting of ingredient (s) of unknown oral toxicity: 10 - 30%</p> <p>Percentage of the mixture consisting of ingredient (s) of unknown dermal toxicity: 1 - 10%</p> <p>Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 30 - 60%</p> <p>Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 15.8%</p>
<b>2.2 GHS label elements</b>		
<b>Hazard pictograms</b>	<p>10X Cas9 Digestion Buffer</p> <p>Cas9 Nuclease</p>	
<b>Signal word</b>	<p>RNase Free Water</p> <p>10X Cas9 Digestion Buffer</p> <p>Cas9 Nuclease</p>	<p>No signal word.</p> <p>Warning</p> <p>Warning</p>
<b>Hazard statements</b>	<p>RNase Free Water</p> <p>10X Cas9 Digestion Buffer</p> <p>Cas9 Nuclease</p>	<p>No known significant effects or critical hazards.</p> <p>H319 - Causes serious eye irritation.</p> <p>H315 - Causes skin irritation.</p> <p>H320 - Causes eye irritation.</p> <p>H317 - May cause an allergic skin reaction.</p>
<b>Precautionary statements</b>		
<b>Prevention</b>	<p>RNase Free Water</p> <p>10X Cas9 Digestion Buffer</p> <p>Cas9 Nuclease</p>	<p>Not applicable.</p> <p>P280 - Wear protective gloves. Wear eye or face protection.</p> <p>P264 - Wash hands thoroughly after handling.</p> <p>P280 - Wear protective gloves.</p> <p>P261 - Avoid breathing vapor.</p> <p>P264 - Wash hands thoroughly after handling.</p> <p>P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.</p>
<b>Response</b>	<p>RNase Free Water</p> <p>10X Cas9 Digestion Buffer</p> <p>Cas9 Nuclease</p>	<p>Not applicable.</p> <p>P302 + P352 + P362+P364 - IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse.</p> <p>P332 + P313 - If skin irritation occurs: Get medical attention.</p> <p>P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P337 + P313 - If eye irritation persists: Get medical attention.</p> <p>P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated</p>

## Section 2. Hazards identification

clothing before reuse.  
 P333 + P313 - If skin irritation or rash occurs: Get medical attention.  
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P337 + P313 - If eye irritation persists: Get medical attention.

**Storage** : RNase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

Not applicable.  
 Not applicable.  
 Not applicable.

**Disposal** : RNase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

Not applicable.  
 Not applicable.  
 P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** : RNase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

None known.  
 None known.  
 None known.

### 2.3 Other hazards

**Hazards not otherwise classified** : RNase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

None known.  
 None known.  
 None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : RNase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

Substance  
 Mixture  
 Mixture

Ingredient name	%	CAS number
<b>RNase Free Water</b> Water	100	7732-18-5
<b>10X Cas9 Digestion Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	≥10 - <20	1185-53-1
Sodium chloride	≤3	7647-14-5
<b>Cas9 Nuclease</b> Glycerol	≥50 - ≤75	56-81-5
Potassium chloride	≤5	7447-40-7
2-Mercaptoethanol	≤0.3	60-24-2

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

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

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

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

<b>Eye contact</b>	:	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.
		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. Continue to rinse for at least 10 minutes. Get medical attention.
		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. If irritation persists, get medical attention.
<b>Inhalation</b>	:	RNase Free Water	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. 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. 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.
<b>Skin contact</b>	:	RNase Free Water	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. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
		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

## Section 4. First aid measures

### Ingestion

: RNase Free Water

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.

Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

10X Cas9 Digestion Buffer

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

Cas9 Nuclease

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

### 4.2 Most important symptoms/effects, acute and delayed

#### Potential acute health effects

#### Eye contact

: RNase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards. Causes serious eye irritation. Causes eye irritation.

#### Inhalation

: RNase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

#### Skin contact

: RNase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards. Causes skin irritation. May cause an allergic skin reaction.

## Section 4. First aid measures

**Ingestion** : Nase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

No known significant effects or critical hazards.  
 No known significant effects or critical hazards.  
 No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Eye contact** : Nase Free Water  
 10X Cas9 Digestion Buffer

Cas9 Nuclease

No specific data.  
 Adverse symptoms may include the following:  
 pain or irritation  
 watering  
 redness

Adverse symptoms may include the following:  
 irritation  
 watering  
 redness

**Inhalation** : Nase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

No specific data.  
 No specific data.  
 No specific data.

**Skin contact** : Nase Free Water  
 10X Cas9 Digestion Buffer

Cas9 Nuclease

No specific data.  
 Adverse symptoms may include the following:  
 irritation  
 redness

Adverse symptoms may include the following:  
 irritation  
 redness

**Ingestion** : Nase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

No specific data.  
 No specific data.  
 No specific data.

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

**Notes to physician** : Nase Free Water

10X Cas9 Digestion Buffer

Cas9 Nuclease

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.  
 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.  
 Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : Nase Free Water  
 10X Cas9 Digestion Buffer  
 Cas9 Nuclease

No specific treatment.  
 No specific treatment.  
 No specific treatment.

**Protection of first-aiders** : Nase Free Water

10X Cas9 Digestion Buffer

Cas9 Nuclease

No action shall be taken involving any personal risk or without suitable training.  
 No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.  
 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.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### 5.1 Extinguishing media

<b>Suitable extinguishing media</b>	: RNase Free Water	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.
<b>Unsuitable extinguishing media</b>	: RNase Free Water	None known.
	10X Cas9 Digestion Buffer	None known.
	Cas9 Nuclease	None known.

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

<b>Specific hazards arising from the chemical</b>	: RNase Free Water	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.
<b>Hazardous thermal decomposition products</b>	: RNase Free Water	No specific data.
	10X Cas9 Digestion Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds metal oxide/oxides
	Cas9 Nuclease	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds metal oxide/oxides

### 5.3 Advice for firefighters

<b>Special protective actions for fire-fighters</b>	: 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.
	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.
<b>Special protective equipment for fire-fighters</b>	: 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.
	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.
	Cas9 Nuclease	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus



## Section 5. Fire-fighting measures

(SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**

: Nase 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 spilled 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders**

: Nase Free Water

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".  
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If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

10X Cas9 Digestion Buffer

Cas9 Nuclease

**6.2 Environmental precautions**

: Nase Free Water

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

10X Cas9 Digestion Buffer

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Cas9 Nuclease

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).



## Section 6. Accidental release measures

### 6.3 Methods and materials 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.

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 7. Handling and storage

### 7.1 Precautions for safe handling

**Protective measures** : RNase Free Water

Put on appropriate personal protective equipment (see Section 8).

10X Cas9 Digestion Buffer

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

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 vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

**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. 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

## Section 7. Handling and storage

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.

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

: 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 unlabeled 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 unlabeled 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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

### 7.3 Specific end use(s)

#### Recommendations

: RNase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

Industrial applications, Professional applications.  
Industrial applications, Professional applications.  
Industrial applications, Professional applications.

#### Industrial sector specific solutions

: RNase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

Not applicable.  
Not applicable.  
Not applicable.

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<b>RNase Free Water</b> Water	None.
<b>10X Cas9 Digestion Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride Sodium chloride	None. None.
<b>Cas9 Nuclease</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust
Potassium chloride 2-Mercaptoethanol	None. <b>AIHA WEEL (United States, 5/2018).</b> <b>Absorbed through skin.</b> TWA: 0.2 ppm 8 hours.

### 8.2 Exposure controls

#### Appropriate engineering controls

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

#### Environmental exposure controls

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

#### Individual protection measures

##### Hygiene measures

: 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: chemical splash goggles.

##### Skin protection

##### Hand protection

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

##### Body protection

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

## Section 8. Exposure controls/personal protection

- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: <input checked="" type="checkbox"/> Nase Free Water	Liquid.
	10X Cas9 Digestion Buffer	Liquid.
	Cas9 Nuclease	Liquid.
<b>Color</b>	: <input checked="" type="checkbox"/> Nase Free Water	Colorless.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Odor</b>	: <input checked="" type="checkbox"/> Nase Free Water	Odorless.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Odor threshold</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>pH</b>	: <input checked="" type="checkbox"/> Nase Free Water	7
	10X Cas9 Digestion Buffer	7
	Cas9 Nuclease	7
<b>Melting point</b>	: <input checked="" type="checkbox"/> Nase Free Water	0°C (32°F)
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Boiling point</b>	: <input checked="" type="checkbox"/> Nase Free Water	100°C (212°F)
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Flash point</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not applicable.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Evaporation rate</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Flammability (solid, gas)</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not applicable.
	10X Cas9 Digestion Buffer	Not applicable.
	Cas9 Nuclease	Not applicable.
<b>Lower and upper explosive (flammable) limits</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Vapor pressure</b>	: <input checked="" type="checkbox"/> Nase Free Water	3.2 kPa (23.8 mm Hg) [room temperature]
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Vapor density</b>	: <input checked="" type="checkbox"/> Nase Free Water	0.62 [Air = 1]
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Relative density</b>	: <input checked="" type="checkbox"/> Nase Free Water	1
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.

## Section 9. Physical and chemical properties

<b>Solubility</b>	: <input checked="" type="checkbox"/> Nase Free Water	Easily soluble in the following materials: cold water and hot water.
	10X Cas9 Digestion Buffer	Soluble in the following materials: cold water and hot water.
	Cas9 Nuclease	Soluble in the following materials: cold water and hot water.
<b>Partition coefficient: n-octanol/water</b>	: <input checked="" type="checkbox"/> Nase Free Water	-1.38
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Auto-ignition temperature</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not applicable.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Decomposition temperature</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.
<b>Viscosity</b>	: <input checked="" type="checkbox"/> Nase Free Water	Not available.
	10X Cas9 Digestion Buffer	Not available.
	Cas9 Nuclease	Not available.

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: <input checked="" type="checkbox"/> Nase Free Water	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.
<b>10.2 Chemical stability</b>	: <input checked="" type="checkbox"/> Nase Free Water	The product is stable.
	10X Cas9 Digestion Buffer	The product is stable.
	Cas9 Nuclease	The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: <input checked="" type="checkbox"/> Nase Free Water	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.
<b>10.4 Conditions to avoid</b>	: <input checked="" type="checkbox"/> Nase Free Water	No specific data.
	10X Cas9 Digestion Buffer	No specific data.
	Cas9 Nuclease	No specific data.
<b>10.5 Incompatible materials</b>	: <input checked="" type="checkbox"/> Nase Free Water	May react or be incompatible with oxidizing materials.
	10X Cas9 Digestion Buffer	May react or be incompatible with oxidizing materials.
	Cas9 Nuclease	May react or be incompatible with oxidizing materials.

## Section 10. Stability and reactivity

<b>10.6 Hazardous decomposition products</b>	: <input checked="" type="checkbox"/> <b>Nase Free Water</b>	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.

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>10X Cas9 Digestion Buffer</b> Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
<b>Cas9 Nuclease</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
2-Mercaptoethanol	LD50 Dermal	Rabbit	167.1 mg/kg	-
	LD50 Oral	Rat	244 mg/kg	-

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>10X Cas9 Digestion Buffer</b> Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>Cas9 Nuclease</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 milligrams	-

#### Sensitization

Not available.

#### Mutagenicity

**Conclusion/Summary** : Not available.

#### Carcinogenicity

**Conclusion/Summary** : Not available.

#### Reproductive toxicity

**Conclusion/Summary** : Not available.

#### Teratogenicity

**Conclusion/Summary** : Not available.

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

## Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
<b>10X Cas9 Digestion Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Category 3	Not applicable.	Respiratory tract irritation
<b>Cas9 Nuclease</b> 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

### Information on the likely routes of exposure

: Nase Free Water  
10X Cas9 Digestion Buffer  
  
Cas9 Nuclease

Not available.  
Routes of entry anticipated: Oral, Dermal, Inhalation.  
Routes of entry anticipated: Oral, Dermal, Inhalation.

### Potential acute health effects

#### Eye contact

: Nase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards.  
Causes serious eye irritation.  
Causes eye irritation.

#### Inhalation

: Nase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.

#### Skin contact

: Nase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards.  
Causes skin irritation.  
May cause an allergic skin reaction.

#### Ingestion

: Nase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

#### Eye contact

: Nase Free Water  
10X Cas9 Digestion Buffer  
  
Cas9 Nuclease

No specific data.  
Adverse symptoms may include the following:  
pain or irritation  
watering  
redness  
Adverse symptoms may include the following:  
irritation  
watering  
redness

#### Inhalation

: Nase Free Water  
10X Cas9 Digestion Buffer  
Cas9 Nuclease

No specific data.  
No specific data.  
No specific data.

#### Skin contact

: Nase Free Water  
10X Cas9 Digestion Buffer  
  
Cas9 Nuclease

No specific data.  
Adverse symptoms may include the following:  
irritation  
redness  
Adverse symptoms may include the following:  
irritation  
redness



## Section 11. Toxicological information

**Ingestion** : Nase Free Water No specific data.  
 10X Cas9 Digestion Buffer No specific data.  
 Cas9 Nuclease No specific data.

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

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

<b>General</b>	: <input checked="" type="checkbox"/> Nase Free Water 10X Cas9 Digestion Buffer Cas9 Nuclease	No known significant effects or critical hazards. No known significant effects or critical hazards. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
<b>Carcinogenicity</b>	: <input checked="" type="checkbox"/> Nase Free Water 10X Cas9 Digestion Buffer Cas9 Nuclease	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Mutagenicity</b>	: <input checked="" type="checkbox"/> Nase Free Water 10X Cas9 Digestion Buffer Cas9 Nuclease	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Teratogenicity</b>	: <input checked="" type="checkbox"/> Nase Free Water 10X Cas9 Digestion Buffer Cas9 Nuclease	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Developmental effects</b>	: <input checked="" type="checkbox"/> Nase Free Water 10X Cas9 Digestion Buffer Cas9 Nuclease	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Fertility effects</b>	: <input checked="" type="checkbox"/> Nase Free Water 10X Cas9 Digestion Buffer Cas9 Nuclease	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
<input checked="" type="checkbox"/> 10X Cas9 Digestion Buffer Oral	126300 mg/kg
<b>Cas9 Nuclease</b> Oral	73446.3 mg/kg

## Section 12. Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>10X Cas9 Digestion Buffer</b> Sodium chloride	Acute EC50 4.74 g/L Fresh water  Acute EC50 519.6 mg/l Fresh water Acute EC50 402.6 mg/l Fresh water Acute IC50 6.87 g/L Fresh water Acute LC50 1000000 µg/l Fresh water Chronic LC10 781 mg/l Fresh water  Chronic NOEC 6 g/L Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Algae - Chlamydomonas reinhardtii Crustaceans - Cypris subglobosa Daphnia - Daphnia magna Aquatic plants - Lemna minor Fish - Morone saxatilis - Larvae Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling) Aquatic plants - Lemna minor Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	96 hours 48 hours 48 hours 96 hours 96 hours 3 weeks  96 hours 21 days 8 weeks
<b>Cas9 Nuclease</b> Glycerol Potassium chloride	Acute LC50 54000 mg/l Fresh water Acute EC50 1337000 µg/l Fresh water Acute EC50 9.24 g/L Fresh water  Acute EC50 141.46 mg/l Fresh water Acute LC50 12.92 mg/l Fresh water  Acute LC50 880 mg/l Fresh water	Fish - Oncorhynchus mykiss Algae - Navicula seminulum Algae - Desmodesmus subspicatus Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate Fish - Pimephales promelas	96 hours 96 hours 72 hours 48 hours 48 hours 96 hours

### 12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
<b>Cas9 Nuclease</b> Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO <sub>2</sub> in Sealed Vessels (Headspace Test)	69 % - Inherent - 60 days	20 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>RNase Free Water</b> Water	-	-	Readily
<b>Cas9 Nuclease</b> Potassium chloride	-	-	Readily

### 12.3 Bioaccumulative potential

## Section 12. Ecological information

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>RNase Free Water</b> Water	-1.38	-	low
<b>Cas9 Nuclease</b> Glycerol	-1.76	-	low
Potassium chloride	-0.46	-	low
2-Mercaptoethanol	-0.056	-	low

### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

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

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

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

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

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

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

## Section 14. Transport information

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

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

**Transport in bulk according to Annex II of MARPOL and the IBC Code** : Not available.

## Section 15. Regulatory information

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

**U.S. Federal regulations** : **TSCA 8(a) PAIR:** Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-  
**TSCA 8(a) CDR Exempt/Partial exemption:** Not determined

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

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

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

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

#### SARA 302/304

##### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

#### SARA 311/312

**Classification** :  **N**ase Free Water Not applicable.  
 10X Cas9 Digestion Buffer SKIN IRRITATION - Category 2  
 EYE IRRITATION - Category 2A  
 EYE IRRITATION - Category 2B  
 Cas9 Nuclease SKIN SENSITIZATION - Category 1

##### Composition/information on ingredients

Name	%	Classification
<input checked="" type="checkbox"/> <b>10X Cas9 Digestion Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	≥10 - <20	SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
Sodium chloride	≤3	EYE IRRITATION - Category 2A
<b>Cas9 Nuclease</b> Glycerol	≥50 - ≤75	EYE IRRITATION - Category 2A
Potassium chloride	≤5	EYE IRRITATION - Category 2A
2-Mercaptoethanol	≤0.3	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 2 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

#### State regulations

**Massachusetts** : The following components are listed: GLYCERINE MIST

**New York** : None of the components are listed.

**New Jersey** : The following components are listed: GLYCERIN; 1,2,3-PROPANETRIOL

**Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL

## Section 15. Regulatory information

### International regulations

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

Not listed.

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

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

<b>Australia</b>	: Not determined.
<b>Canada</b>	: All components are listed or exempted.
<b>China</b>	: Not determined.
<b>Europe</b>	: All components are listed or exempted.
<b>Japan</b>	: <b>Japan inventory (ENCS):</b> Not determined. <b>Japan inventory (ISHL):</b> Not determined.
<b>Malaysia</b>	: Not determined.
<b>New Zealand</b>	: Not determined.
<b>Philippines</b>	: Not determined.
<b>Republic of Korea</b>	: Not determined.
<b>Taiwan</b>	: <input checked="" type="checkbox"/> All components are listed or exempted.
<b>Thailand</b>	: <input checked="" type="checkbox"/> Not determined.
<b>Turkey</b>	: Not determined.
<b>United States</b>	: All components are listed or exempted.
<b>Viet Nam</b>	: <input checked="" type="checkbox"/> Not determined.

## Section 16. Other information

### History

<b>Date of issue</b>	: 11/16/2018
<b>Date of previous issue</b>	: 10/14/2016
<b>Version</b>	: 4

### Procedure used to derive the classification

Classification	Justification
<b>10X Cas9 Digestion Buffer</b> SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A	Calculation method Calculation method
<b>Cas9 Nuclease</b> EYE IRRITATION - Category 2B SKIN SENSITIZATION - Category 1	Calculation method Calculation method

Indicates information that has changed from previously issued version.

## Section 16. Other information

### [Notice to reader](#)

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