Conforms to HPR 2015

SAFETY DATA SHEET

Agilent Technologies

T7 RNA Polymerase 5000U, Part Number 600123

Section 1. Identification

Product identifier : T7 RNA Polymerase 5000U, Part Number 600123

Part no. (chemical kit) : 600123

Part no. :

T7 RNA Polymerase	600123-51
RNA Polymerase Dilution Buffer	600110-83
5X Transcription Buffer	600110-82

Material uses : Analytical reagent.

T7 RNA Polymerase	1 ml (5000 U 50 U/µl)
RNA Polymerase Dilution Buffer	1 ml
5X Transcription Buffer	1 ml

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

Emergency telephone number (with hours of operation) : CHEMTREC®: 1-800-424-9300

Section 2. Hazard identification

Classification of the substance or mixture

T7 RNA Polymerase
H320 EYE IRRITATION - Category 2B

RNA Polymerase Dilution Buffer
H320 EYE IRRITATION - Category 2B

5X Transcription Buffer
H412 AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements

Signal word :

T7 RNA Polymerase	Warning
RNA Polymerase Dilution Buffer	Warning
5X Transcription Buffer	No signal word.

Hazard statements :

T7 RNA Polymerase	H320 - Causes eye irritation.
RNA Polymerase Dilution Buffer	H320 - Causes eye irritation.
5X Transcription Buffer	H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention :

T7 RNA Polymerase	Not applicable.
RNA Polymerase Dilution Buffer	Not applicable.
5X Transcription Buffer	P273 - Avoid release to the environment.

Section 2. Hazard identification

Response	:	T7 RNA Polymerase	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 advice or attention.
		RNA Polymerase Dilution Buffer	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 advice or attention.
		5X Transcription Buffer	Not applicable.
Storage	:	T7 RNA Polymerase	Not applicable.
		RNA Polymerase Dilution Buffer	Not applicable.
		5X Transcription Buffer	Not applicable.
Disposal	:	T7 RNA Polymerase	Not applicable.
		RNA Polymerase Dilution Buffer	Not applicable.
		5X Transcription Buffer	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements	:	T7 RNA Polymerase	None known.
		RNA Polymerase Dilution Buffer	None known.
		5X Transcription Buffer	None known.
Other hazards which do not result in classification	:	T7 RNA Polymerase	None known.
		RNA Polymerase Dilution Buffer	None known.
		5X Transcription Buffer	None known.

Section 3. Composition/information on ingredients

Substance/mixture	:	T7 RNA Polymerase	Mixture
		RNA Polymerase Dilution Buffer	Mixture
		5X Transcription Buffer	Mixture

Ingredient name	% (w/w)	CAS number
T7 RNA Polymerase		
Glycerol	30 - 60	56-81-5
RNA Polymerase Dilution Buffer		
Glycerol	30 - 60	56-81-5
5X Transcription Buffer		
Trometamol	1 - 5	77-86-1
Sodium chloride	0.5 - 1.5	7647-14-5
Magnesium chloride	0.1 - 1	7786-30-3

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

Description of necessary first aid measures

Eye contact :

T7 RNA Polymerase: 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.

RNA Polymerase Dilution 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. If irritation persists, get medical attention.

5X Transcription 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 if irritation occurs.

Inhalation :

T7 RNA Polymerase: 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.

RNA Polymerase Dilution 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.

5X Transcription 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.

Section 4. First-aid measures

Skin contact	:	T7 RNA Polymerase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
		RNA Polymerase Dilution Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
		5X Transcription Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	:	T7 RNA Polymerase	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.
		RNA Polymerase Dilution Buffer	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if 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.
		5X Transcription Buffer	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if 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.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Section 4. First-aid measures

Eye contact	:	T7 RNA Polymerase	Causes eye irritation.
		RNA Polymerase Dilution Buffer	Causes eye irritation.
		5X Transcription Buffer	No known significant effects or critical hazards.
Inhalation	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.
Skin contact	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.
Ingestion	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	:	T7 RNA Polymerase	Adverse symptoms may include the following: irritation watering redness
		RNA Polymerase Dilution Buffer	Adverse symptoms may include the following: irritation watering redness
		5X Transcription Buffer	No specific data.
Inhalation	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	No specific data.
Skin contact	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	No specific data.
Ingestion	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	No specific data.

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

Notes to physician	:	T7 RNA Polymerase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		RNA Polymerase Dilution Buffer	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		5X Transcription 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.
Specific treatments	:	T7 RNA Polymerase	No specific treatment.
		RNA Polymerase Dilution Buffer	No specific treatment.
		5X Transcription Buffer	No specific treatment.

Section 4. First-aid measures

Protection of first-aiders	:	T7 RNA Polymerase	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.
		RNA Polymerase Dilution Buffer	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
		5X Transcription Buffer	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	:	T7 RNA Polymerase	Use an extinguishing agent suitable for the surrounding fire.
		RNA Polymerase Dilution Buffer	Use an extinguishing agent suitable for the surrounding fire.
		5X Transcription Buffer	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	:	T7 RNA Polymerase	None known.
		RNA Polymerase Dilution Buffer	None known.
		5X Transcription Buffer	None known.
Specific hazards arising from the chemical	:	T7 RNA Polymerase	In a fire or if heated, a pressure increase will occur and the container may burst.
		RNA Polymerase Dilution Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
		5X Transcription Buffer	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous thermal decomposition products	:	T7 RNA Polymerase	Decomposition products may include the following materials: carbon dioxide carbon monoxide
		RNA Polymerase Dilution Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide
		5X Transcription Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds metal oxide/oxides

Section 5. Fire-fighting measures

Special protective actions for fire-fighters	:	T7 RNA Polymerase	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.
		RNA Polymerase Dilution 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.
		5X Transcription 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.
Special protective equipment for fire-fighters	:	T7 RNA Polymerase	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
		RNA Polymerase Dilution Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
		5X Transcription Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	T7 RNA Polymerase	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.
		RNA Polymerase Dilution 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.
		5X Transcription 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.
For emergency responders	:	T7 RNA Polymerase	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".
		RNA Polymerase Dilution Buffer	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

	5X Transcription Buffer	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions :	T7 RNA Polymerase	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).
	RNA Polymerase Dilution 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).
	5X Transcription 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). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Methods for cleaning up :	T7 RNA Polymerase	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.
	RNA Polymerase Dilution 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.
	5X Transcription 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.

Section 7. Handling and storage

Precautions for safe handling

Protective measures :	T7 RNA Polymerase	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.
	RNA Polymerase Dilution Buffer	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers

Section 7. Handling and storage

			retain product residue and can be hazardous. Do not reuse container.
		5X Transcription 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. Avoid release to the environment. 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	:	T7 RNA Polymerase	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.
		RNA Polymerase Dilution 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.
		5X Transcription 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.
Conditions for safe storage, including any incompatibilities	:	T7 RNA Polymerase	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.
		RNA Polymerase Dilution 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.
		5X Transcription 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

Section 7. Handling and storage

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.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
T7 RNA Polymerase Glycerol	**CA Alberta Provincial (Canada, 6/2018).** 8 hrs OEL: 10 mg/m³ 8 hours. Form: Mist **CA Quebec Provincial (Canada, 7/2019).** TWAEV: 10 mg/m³ 8 hours. Form: mist **CA Saskatchewan Provincial (Canada, 7/2013).** STEL: 20 mg/m³ 15 minutes. Form: mist TWA: 10 mg/m³ 8 hours. Form: mist **CA British Columbia Provincial (Canada, 1/2021).** TWA: 3 mg/m³ 8 hours. Form: respirable mist TWA: 10 mg/m³ 8 hours. Form: total mist
RNA Polymerase Dilution Buffer Glycerol	**CA Alberta Provincial (Canada, 6/2018).** 8 hrs OEL: 10 mg/m³ 8 hours. Form: Mist **CA Quebec Provincial (Canada, 7/2019).** TWAEV: 10 mg/m³ 8 hours. Form: mist **CA Saskatchewan Provincial (Canada, 7/2013).** STEL: 20 mg/m³ 15 minutes. Form: mist TWA: 10 mg/m³ 8 hours. Form: mist **CA British Columbia Provincial (Canada, 1/2021).** TWA: 3 mg/m³ 8 hours. Form: respirable mist TWA: 10 mg/m³ 8 hours. Form: total mist

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.

Section 8. Exposure controls/personal protection

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.

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 and safety characteristics

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

Appearance

Physical state :	T7 RNA Polymerase	Liquid.
	RNA Polymerase Dilution Buffer	Liquid.
	5X Transcription Buffer	Liquid.
Color :	T7 RNA Polymerase	Not available.
	RNA Polymerase Dilution Buffer	Not available.
	5X Transcription Buffer	Not available.
Odor :	T7 RNA Polymerase	Not available.
	RNA Polymerase Dilution Buffer	Not available.
	5X Transcription Buffer	Not available.
Odor threshold :	T7 RNA Polymerase	Not available.
	RNA Polymerase Dilution Buffer	Not available.
	5X Transcription Buffer	Not available.
pH :	T7 RNA Polymerase	7.7
	RNA Polymerase Dilution Buffer	7.7
	5X Transcription Buffer	8
Melting point/freezing point :	T7 RNA Polymerase	Not available.
	RNA Polymerase Dilution Buffer	Not available.
	5X Transcription Buffer	0°C (32°F)

Section 9. Physical and chemical properties and safety characteristics

Boiling point, initial boiling point, and boiling range :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	100°C (212°F)

Flash point :

Ingredient name	Closed cup °C	Closed cup °F	Closed cup Method	Open cup °C	Open cup °F	Open cup Method
T7 RNA Polymerase						
Edetic acid	>100	>212	DIN 51758			
(R*,R*) -1,4-Dimercaptobutane-2,3-diol	>110	>230				
RNA Polymerase Dilution Buffer						
Edetic acid	>100	>212	DIN 51758			
(R*,R*) -1,4-Dimercaptobutane-2,3-diol	>110	>230				

Evaporation rate :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	Not available.

Flammability :

T7 RNA Polymerase	Not applicable.
RNA Polymerase Dilution Buffer	Not applicable.
5X Transcription Buffer	Not applicable.

Lower and upper explosion limit/flammability limit :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	Not available.

Vapor pressure :

Ingredient name	Vapor Pressure at 20˚C mm Hg	Vapor Pressure at 20˚C kPa	Vapor Pressure at 20˚C Method	Vapor pressure at 50˚C mm Hg	Vapor pressure at 50˚C kPa	Vapor pressure at 50˚C Method
T7 RNA Polymerase						
Water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
RNA Polymerase Dilution Buffer						
Water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
5X Transcription Buffer						
Water	23.8	3.2		92.258	12.3	
Trometamol	<0.00075006	<0.0001				

Relative vapor density :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	Not available.

Section 9. Physical and chemical properties and safety characteristics

Relative density :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	Not available.

Solubility :

T7 RNA Polymerase	Easily soluble in the following materials: cold water and hot water.
RNA Polymerase Dilution Buffer	Soluble in the following materials: cold water and hot water.
5X Transcription Buffer	Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water :

T7 RNA Polymerase	Not applicable.
RNA Polymerase Dilution Buffer	Not applicable.
5X Transcription Buffer	Not applicable.

Auto-ignition temperature :

Ingredient name	°C	°F	Method
T7 RNA Polymerase			
Glycerol	370	698	
Edetic acid	>400	>752	VDI 2263
RNA Polymerase Dilution Buffer			
Glycerol	370	698	
Edetic acid	>400	>752	VDI 2263

Decomposition temperature :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	Not available.

Viscosity :

T7 RNA Polymerase	Not available.
RNA Polymerase Dilution Buffer	Not available.
5X Transcription Buffer	Not available.

Particle characteristics

Median particle size :

T7 RNA Polymerase	Not applicable.
RNA Polymerase Dilution Buffer	Not applicable.
5X Transcription Buffer	Not applicable.

Section 10. Stability and reactivity

Reactivity :

T7 RNA Polymerase	No specific test data related to reactivity available for this product or its ingredients.
RNA Polymerase Dilution Buffer	No specific test data related to reactivity available for this product or its ingredients.
5X Transcription Buffer	No specific test data related to reactivity available for this product or its ingredients.

Chemical stability :

T7 RNA Polymerase	The product is stable.
RNA Polymerase Dilution Buffer	The product is stable.
5X Transcription Buffer	The product is stable.

Section 10. Stability and reactivity

Possibility of hazardous reactions	:	T7 RNA Polymerase	Under normal conditions of storage and use, hazardous reactions will not occur.
		RNA Polymerase Dilution Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
		5X Transcription Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	No specific data.
Incompatible materials	:	T7 RNA Polymerase	May react or be incompatible with oxidizing materials.
		RNA Polymerase Dilution Buffer	May react or be incompatible with oxidizing materials.
		5X Transcription Buffer	May react or be incompatible with oxidizing materials.
Hazardous decomposition products	:	T7 RNA Polymerase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		RNA Polymerase Dilution Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		5X Transcription Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
T7 RNA Polymerase				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
RNA Polymerase Dilution Buffer				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
5X Transcription Buffer				
Trometamol	LD50 Dermal	Rat	>5000 mg/kg	-
Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
Magnesium chloride	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat	2800 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
T7 RNA Polymerase					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
RNA Polymerase Dilution Buffer					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500	-

Section 11. Toxicological information

	Skin - Mild irritant	Rabbit	-	mg 24 hours 500 mg	-
5X Transcription Buffer					
Trometamol	Skin - Moderate irritant	Rabbit	-	25 %	-
	Skin - Severe irritant	Rabbit	-	500 mg	-
Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Eyes - Moderate irritant	Rabbit	-	10 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-

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)

Name	Category	Route of exposure	Target organs
5X Transcription Buffer Trometamol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure :

T7 RNA Polymerase	Routes of entry anticipated: Oral, Dermal, Inhalation.
RNA Polymerase Dilution Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation.
5X Transcription Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact :

T7 RNA Polymerase	Causes eye irritation.
RNA Polymerase Dilution Buffer	Causes eye irritation.
5X Transcription Buffer	No known significant effects or critical hazards.

Inhalation :

T7 RNA Polymerase	No known significant effects or critical hazards.
RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
5X Transcription Buffer	No known significant effects or critical hazards.

Skin contact :

T7 RNA Polymerase	No known significant effects or critical hazards.
RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
5X Transcription Buffer	No known significant effects or critical hazards.

Section 11. Toxicological information

Ingestion	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	:	T7 RNA Polymerase	Adverse symptoms may include the following: irritation watering redness
		RNA Polymerase Dilution Buffer	Adverse symptoms may include the following: irritation watering redness
		5X Transcription Buffer	No specific data.
Inhalation	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	No specific data.
Skin contact	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	No specific data.
Ingestion	:	T7 RNA Polymerase	No specific data.
		RNA Polymerase Dilution Buffer	No specific data.
		5X Transcription Buffer	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

General	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.
Carcinogenicity	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.
Mutagenicity	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.
Reproductive toxicity	:	T7 RNA Polymerase	No known significant effects or critical hazards.
		RNA Polymerase Dilution Buffer	No known significant effects or critical hazards.
		5X Transcription Buffer	No known significant effects or critical hazards.

Section 11. Toxicological information

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
T7 RNA Polymerase					
Glycerol	12600	N/A	N/A	N/A	N/A
RNA Polymerase Dilution Buffer					
Glycerol	12600	N/A	N/A	N/A	N/A
5X Transcription Buffer					
5X Transcription Buffer	200000	N/A	N/A	N/A	N/A
Sodium chloride	3000	N/A	N/A	N/A	N/A
Magnesium chloride	2800	2500	N/A	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
T7 RNA Polymerase			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
RNA Polymerase Dilution Buffer			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
5X Transcription Buffer			
Trometamol	Acute EC50 >980 mg/l Fresh water	Daphnia	48 hours
	Acute NOEC 520 mg/l Fresh water	Daphnia	48 hours
Sodium chloride	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute EC50 402.6 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks
Magnesium chloride	Acute EC50 >100 mg/l Fresh water	Algae - Desmodesmus subspicatus	72 hours
	Acute EC50 180000 µg/l Fresh water	Crustaceans - Eudiaptomus padanus ssp. padanus - Adult	48 hours
	Acute IC50 6.8 mg/l Fresh water	Aquatic plants - Lemna aequinoctialis	96 hours
	Acute LC50 32000 µg/l Fresh water	Daphnia - Daphnia hyalina - Adult	48 hours
	Acute LC50 2120 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute NOEC 100 mg/l Fresh water	Algae - Desmodesmus	72 hours

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	Chronic NOEC 0.1 mg/l Fresh water	subspicatus Fish - Cyprinus carpio	35 days

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
T7 RNA Polymerase Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
RNA Polymerase Dilution Buffer Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
5X Transcription Buffer Trometamol	OECD 301F Ready Biodegradability - Manometric Respirometry Test	97.1 % - Readily - 28 days	30 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
5X Transcription Buffer Trometamol	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
T7 RNA Polymerase Glycerol	-1.76	-	low
RNA Polymerase Dilution Buffer Glycerol	-1.76	-	low
5X Transcription Buffer Trometamol	-2.31	-	low

Mobility in soil

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

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

Section 13. Disposal considerations

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.

Section 14. Transport information

TDG / 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 IMO instruments : Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

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 : At least one component is not listed in DSL but all such components are listed in NDSL.

China : All components are listed or exempted.

Europe : All components are listed or exempted.

Japan : **Japan inventory (CSCL)**: Not determined.
Japan inventory (ISHL): Not determined.

New Zealand : All components are listed or exempted.

Philippines : Not determined.

Section 15. Regulatory information

Republic of Korea : Not determined.

Taiwan : All components are listed or exempted.

Thailand : Not determined.

Turkey : Not determined.

United States : All components are active or exempted.

Viet Nam : All components are listed or exempted.

Section 16. Other information

History

Date of issue/Date of revision : 03/22/2022

Date of previous issue : 05/30/2017

Version : 6

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HPR = Hazardous Products Regulations
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
UN = United Nations

Procedure used to derive the classification

Classification	Justification
T7 RNA Polymerase EYE IRRITATION - Category 2B	Calculation method
RNA Polymerase Dilution Buffer EYE IRRITATION - Category 2B	Calculation method
5X Transcription Buffer AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

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