

SAFETY DATA SHEET

PfuTurbo Cx Hotstart DNA Polymerase, Part Number 600410

Section 1. Identification

Product identifier : PfuTurbo Cx Hotstart DNA Polymerase, Part Number 600410

Part no. (chemical kit) : 600410

Part no. : DMSO 600260-53
PfuTurbo Cx Hotstart DNA Polymerase 600410-51
10X PfuTurbo Cx Reaction Buffer 600410-52

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

Identified uses : ☒ Analytical reagent.

☒ DMSO 1 ml
PfuTurbo Cx Hotstart DNA Polymerase 40 µl (100 U 2.5 U/µl)
10X PfuTurbo Cx Reaction Buffer 4 x 1 ml

Supplier/Manufacturer : Agilent Technologies Australia Pty Ltd
679 Springvale Road
Mulgrave
Victoria 3170, Australia
1800 802 402

Emergency telephone number (with hours of operation) : CHEMTREC®: +(61)-290372994

Section 2. Hazard(s) identification

Classification of the substance or mixture

☒ DMSO
H227 FLAMMABLE LIQUIDS - Category 4
H320 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B

PfuTurbo Cx Hotstart DNA Polymerase
H320 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B

10X PfuTurbo Cx Reaction Buffer
H319 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A
H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

GHS label elements

Hazard pictograms : ☒ 10X PfuTurbo Cx Reaction Buffer



Signal word : ☒ DMSO WARNING
PfuTurbo Cx Hotstart DNA WARNING
Polymerase
10X PfuTurbo Cx Reaction WARNING
Buffer

Section 2. Hazard(s) identification

Hazard statements	: DMSO	H227 - Combustible liquid. H320 - Causes eye irritation. H320 - Causes eye irritation.
	PfuTurbo Cx Hotstart DNA Polymerase	
	10X PfuTurbo Cx Reaction Buffer	H319 - Causes serious eye irritation. H412 - Harmful to aquatic life with long lasting effects.
Precautionary statements		
Prevention	: DMSO	P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Not applicable.
	PfuTurbo Cx Hotstart DNA Polymerase	
	10X PfuTurbo Cx Reaction Buffer	P280 - Wear eye or face protection. P273 - Avoid release to the environment.
Response	: DMSO	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.
	PfuTurbo Cx Hotstart DNA 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.
	10X PfuTurbo Cx Reaction 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.
Storage	: DMSO	Not applicable.
	PfuTurbo Cx Hotstart DNA Polymerase	Not applicable.
	10X PfuTurbo Cx Reaction Buffer	Not applicable.
Disposal	: DMSO	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	PfuTurbo Cx Hotstart DNA Polymerase	Not applicable.
	10X PfuTurbo Cx Reaction Buffer	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements		
Additional warning phrases	: DMSO	Not applicable.
	PfuTurbo Cx Hotstart DNA Polymerase	Not applicable.
	10X PfuTurbo Cx Reaction Buffer	Not applicable.
Other hazards which do not result in classification	: DMSO	None known.
	PfuTurbo Cx Hotstart DNA Polymerase	None known.
	10X PfuTurbo Cx Reaction Buffer	None known.

Section 3. Composition and ingredient information

Substance/mixture	:	DMSO	Substance
		PfuTurbo Cx Hotstart DNA Polymerase	Mixture
		10X PfuTurbo Cx Reaction Buffer	Mixture

CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
DMSO Dimethyl sulfoxide	100	67-68-5
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	≥30 - ≤60	56-81-5
10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	<2.5	9002-93-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

The total concentration of ingredients in this product, reported or not in this section, is 100%.

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

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	:	DMSO	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.
		PfuTurbo Cx Hotstart DNA 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.
		10X PfuTurbo Cx Reaction 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.
Inhalation	:	DMSO	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.
		PfuTurbo Cx Hotstart DNA 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

Section 4. First aid measures

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.

10X PfuTurbo Cx Reaction 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.

Skin contact

:  DMSO

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.

PfuTurbo Cx Hotstart DNA 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.

10X PfuTurbo Cx Reaction 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

:  DMSO

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.

PfuTurbo Cx Hotstart DNA 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.

10X PfuTurbo Cx Reaction Buffer

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed

Section 4. First aid measures

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

Eye contact	: DMSO	Causes eye irritation.
	PfuTurbo Cx Hotstart DNA Polymerase	Causes eye irritation.
	10X PfuTurbo Cx Reaction Buffer	Causes serious eye irritation.
Inhalation	: DMSO	No known significant effects or critical hazards.
	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
Skin contact	: DMSO	No known significant effects or critical hazards.
	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
Ingestion	: DMSO	No known significant effects or critical hazards.
	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	: DMSO	Adverse symptoms may include the following: irritation watering redness
	PfuTurbo Cx Hotstart DNA Polymerase	Adverse symptoms may include the following: irritation watering redness
	10X PfuTurbo Cx Reaction Buffer	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	: DMSO	No specific data.
	PfuTurbo Cx Hotstart DNA Polymerase	No specific data.
	10X PfuTurbo Cx Reaction Buffer	No specific data.
Skin contact	: DMSO	No specific data.
	PfuTurbo Cx Hotstart DNA Polymerase	No specific data.
	10X PfuTurbo Cx Reaction Buffer	No specific data.


Section 4. First aid measures

Ingestion	: DMSO	No specific data.
	PfuTurbo Cx Hotstart DNA Polymerase	No specific data.
	10X PfuTurbo Cx Reaction Buffer	No specific data.
<u>Indication of immediate medical attention and special treatment needed, if necessary</u>		
Notes to physician	: DMSO	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	PfuTurbo Cx Hotstart DNA Polymerase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	10X PfuTurbo Cx Reaction 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	: DMSO	No specific treatment.
	PfuTurbo Cx Hotstart DNA Polymerase	No specific treatment.
	10X PfuTurbo Cx Reaction Buffer	No specific treatment.
Protection of first-aiders	:  DMSO	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.
	PfuTurbo Cx Hotstart DNA 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.
	10X PfuTurbo Cx Reaction 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. Firefighting measures

Extinguishing media


Suitable extinguishing media	: DMSO	Use dry chemical, CO ₂ , water spray (fog) or foam.
	PfuTurbo Cx Hotstart DNA Polymerase	Use an extinguishing agent suitable for the surrounding fire.
	10X PfuTurbo Cx Reaction Buffer	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: DMSO	Do not use water jet.
	PfuTurbo Cx Hotstart DNA Polymerase	None known.
	10X PfuTurbo Cx Reaction Buffer	None known.
Specific hazards arising from the chemical	:  DMSO	Combustible liquid. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.
	PfuTurbo Cx Hotstart DNA Polymerase	In a fire or if heated, a pressure increase will occur and the container may burst.

Section 5. Firefighting measures

	10X PfuTurbo Cx Reaction 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	: DMSO	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
	PfuTurbo Cx Hotstart DNA Polymerase	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	10X PfuTurbo Cx Reaction Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds
Special protective actions for fire-fighters	: DMSO	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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
	PfuTurbo Cx Hotstart DNA 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.
	10X PfuTurbo Cx Reaction 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	: DMSO	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	PfuTurbo Cx Hotstart DNA Polymerase	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	10X PfuTurbo Cx Reaction 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	:  DMSO	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate
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Section 6. Accidental release measures

PfuTurbo Cx Hotstart DNA Polymerase

personal protective equipment.

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

10X PfuTurbo Cx Reaction Buffer

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : DMSO

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

PfuTurbo Cx Hotstart DNA Polymerase

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

10X PfuTurbo Cx Reaction Buffer

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

Environmental precautions :  DMSO

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

PfuTurbo Cx Hotstart DNA Polymerase

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

10X PfuTurbo Cx Reaction Buffer

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and material for containment and cleaning up

Methods for cleaning up : DMSO

Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. 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.

PfuTurbo Cx Hotstart DNA 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.

10X PfuTurbo Cx Reaction

Stop leak if without risk. Move containers from spill

Section 6. Accidental release measures

Buffer

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

: DMSO

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

PfuTurbo Cx Hotstart DNA Polymerase

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

10X PfuTurbo Cx Reaction Buffer

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour 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

: DMSO

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.

PfuTurbo Cx Hotstart DNA 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.

10X PfuTurbo Cx Reaction 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.

Store in accordance with local regulations. Store in a segregated and approved area. 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. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

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

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

Section 8. Exposure controls and personal protection

Ingredient name	Exposure limits
 DMSO Dimethyl sulfoxide	DFG MAC-values list (Germany, 10/2021). Absorbed through skin. PEAK: 320 mg/m ³ , 4 times per shift, 15 minutes. TWA: 160 mg/m ³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours.
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	Safe Work Australia (Australia, 12/2019). TWA: 10 mg/m ³ 8 hours.

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

Section 8. Exposure controls and personal protection

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.

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	DMSO	Liquid. [Clear.]
	PfuTurbo Cx Hotstart DNA Polymerase	Liquid.
Colour	10X PfuTurbo Cx Reaction Buffer	Liquid.
	DMSO	Colourless.
Odour	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	Not available.
	DMSO	Odourless. [Slight]
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	Not available.

Section 9. Physical and chemical properties and safety characteristics

Odour threshold	: DMSO	Not available.
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	Not available.
pH	: DMSO	Not available.
	PfuTurbo Cx Hotstart DNA Polymerase	8.2
	10X PfuTurbo Cx Reaction Buffer	8.8
Melting point/freezing point	: DMSO	18.5°C (65.3°F)
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	0°C (32°F)
Boiling point, initial boiling point, and boiling range	: DMSO	189°C (372.2°F)
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	100°C (212°F)
Flash point	: DMSO	Closed cup: 87°C (188.6°F) [ASTM D 93] Open cup: 87°C (188.6°F)
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	Not available.

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
PfuTurbo Cx Hotstart DNA Polymerase						
Glycerol				177	350.6	
10X PfuTurbo Cx Reaction Buffer						
Polyoxyethylene octyl phenyl ether	251	483.8				

Evaporation rate	: DMSO	0.026 (butyl acetate = 1)
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	Not available.
Flammability	: DMSO	Not applicable.
	PfuTurbo Cx Hotstart DNA Polymerase	Not applicable.
	10X PfuTurbo Cx Reaction Buffer	Not applicable.
Lower and upper explosion limit/flammability limit	: DMSO	Lower: 2.6% Upper: 28.5%
	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
	10X PfuTurbo Cx Reaction Buffer	Not available.

Section 9. Physical and chemical properties and safety characteristics

Vapour pressure : DMSO 0.056 kPa (0.42 mm Hg) [EU A.4]
 PfuTurbo Cx Hotstart DNA Polymerase Not available.
 10X PfuTurbo Cx Reaction Buffer Not available.

Ingredient name	Vapour Pressure at 20 °C			Vapour pressure at 50 °C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
PfuTurbo Cx Hotstart DNA Polymerase						
water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
10X PfuTurbo Cx Reaction Buffer						
water	23.8	3.2		92.258	12.3	
Polyoxyethylene octyl phenyl ether	0.997581	0.13				

Relative vapour density : DMSO 2.7 [Air = 1]
 PfuTurbo Cx Hotstart DNA Polymerase Not available.
 10X PfuTurbo Cx Reaction Buffer Not available.

Relative density : DMSO 1.1
 PfuTurbo Cx Hotstart DNA Polymerase Not available.
 10X PfuTurbo Cx Reaction Buffer Not available.

Solubility(ies)	Media	Result
	DMSO	
	water	Soluble
	PfuTurbo Cx Hotstart DNA Polymerase	
	water	Soluble
	10X PfuTurbo Cx Reaction Buffer	
	water	Soluble

Partition coefficient: n-octanol/water : DMSO -1.35
 PfuTurbo Cx Hotstart DNA Polymerase Not applicable.
 10X PfuTurbo Cx Reaction Buffer Not applicable.

Auto-ignition temperature : DMSO 300 to 302 °C (572 to 575.6 °F)
 PfuTurbo Cx Hotstart DNA Polymerase Not available.
 10X PfuTurbo Cx Reaction Buffer Not available.

Section 9. Physical and chemical properties and safety characteristics

	Ingredient name	°C	°F	Method
	PfuTurbo Cx Hotstart DNA Polymerase			
	Glycerol	370	698	
Decomposition temperature	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	140 to 189°C (284 to 372.2°F) Not available. Not available.		
Viscosity	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Dynamic: 2.14 mPa·s (2.14 cP) Not available. Not available.		
Particle characteristics				
Median particle size	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Not applicable. Not applicable. Not applicable.		

Section 10. Stability and reactivity

Reactivity	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	The product is stable. The product is stable. The product is stable.
Possibility of hazardous reactions	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapour to accumulate in low or confined areas. No specific data. No specific data.

Section 10. Stability and reactivity


Incompatible materials	: DMSO	Reactive or incompatible with the following materials: oxidising materials
	PfuTurbo Cx Hotstart DNA Polymerase	May react or be incompatible with oxidising materials.
	10X PfuTurbo Cx Reaction Buffer	May react or be incompatible with oxidising materials.

Hazardous decomposition products	: DMSO	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	PfuTurbo Cx Hotstart DNA Polymerase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	10X PfuTurbo Cx Reaction 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
 DMSO Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	LD50 Oral	Rat	12600 mg/kg	-
10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	LD50 Oral	Rat	1800 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
 DMSO Dimethyl sulfoxide	Eyes - Mild irritant Eyes - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500 mg	- -
	Skin - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500 mg	- -
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	Eyes - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	24 hours 500 mg 24 hours 500 mg	- -
10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	Skin - Mild irritant	Rabbit	-	24 hours 500 uL	-

Sensitisation

Not available.

Mutagenicity

Section 11. Toxicological information

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)


Not available.

Specific target organ toxicity (repeated exposure)


Not available.

Aspiration hazard


Not available.

Information on likely routes of exposure	:  DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes. Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes. Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
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Potential acute health effects

Eye contact	:  DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Causes eye irritation. Causes eye irritation. Causes serious eye irritation.
Inhalation	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Skin contact	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Ingestion	: DMSO PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	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	:  DMSO	Adverse symptoms may include the following: irritation watering redness
	PfuTurbo Cx Hotstart DNA Polymerase	Adverse symptoms may include the following: irritation watering redness
	10X PfuTurbo Cx Reaction Buffer	Adverse symptoms may include the following: pain or irritation watering

Section 11. Toxicological information

Inhalation	:	DMSO	redness
	:	PfuTurbo Cx Hotstart DNA Polymerase	No specific data.
	:	10X PfuTurbo Cx Reaction Buffer	No specific data.
	:		No specific data.
Skin contact	:	DMSO	No specific data.
	:	PfuTurbo Cx Hotstart DNA Polymerase	No specific data.
	:	10X PfuTurbo Cx Reaction Buffer	No specific data.
	:		No specific data.
Ingestion	:	DMSO	No specific data.
	:	PfuTurbo Cx Hotstart DNA Polymerase	No specific data.
	:	10X PfuTurbo Cx Reaction Buffer	No specific data.
	:		No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	:	DMSO	No known significant effects or critical hazards.
	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	:	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
	:		No known significant effects or critical hazards.
Carcinogenicity	:	DMSO	No known significant effects or critical hazards.
	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	:	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
	:		No known significant effects or critical hazards.
Mutagenicity	:	DMSO	No known significant effects or critical hazards.
	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	:	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
	:		No known significant effects or critical hazards.
Reproductive toxicity	:	DMSO	No known significant effects or critical hazards.
	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
	:	10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
	:		No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Section 11. Toxicological information

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
DMSO Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	12600	N/A	N/A	N/A	N/A
10X PfuTurbo Cx Reaction Buffer 10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	180000.0 1800	N/A N/A	N/A N/A	N/A N/A	N/A N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
DMSO Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 µl/L Marine water Chronic NOEC 100 µl/L Fresh water	Daphnia - Daphnia magna - Neonate Fish - Pimephales promelas Algae - Ulva lactuca Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 96 hours 72 hours 21 days
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	Acute LC50 5.85 mg/l Fresh water Acute LC50 11.2 mg/l Fresh water Acute LC50 4500 µg/l Fresh water	Crustaceans - Ceriodaphnia rigaudi - Neonate Daphnia - Daphnia magna - Neonate Fish - Pimephales promelas	48 hours 48 hours 96 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
DMSO Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-

Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
DMSO Dimethyl sulfoxide	-	-	Not readily
10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	-	-	Readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
DMSO Dimethyl sulfoxide	-1.35	3.16	low
PfuTurbo Cx Hotstart DNA Polymerase Glycerol	-1.76	-	low
10X PfuTurbo Cx Reaction Buffer Polyoxyethylene octyl phenyl ether	4.86	-	high

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 minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. 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 spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

ADG / IMDG / IATA : Not regulated as Dangerous Goods according to the ADG Code .

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

[Standard for the Uniform Scheduling of Medicines and Poisons](#)

6

[Model Work Health and Safety Regulations - Scheduled Substances](#)

No listed substance

[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	: All components are listed or exempted.
Canada	: All components are listed or exempted.
China	: All components are listed or exempted.
Eurasian Economic Union	: Russian Federation inventory : 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	: All components are listed or exempted.
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. Any other relevant information

[History](#)

Date of issue/Date of revision : 16/12/2022

Date of previous issue : 27/05/2022

Version : 6.1

[Key to abbreviations](#)

: ADG = Australian Dangerous Goods
 ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
 ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 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

Section 16. Any other relevant information

SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
DMSO FLAMMABLE LIQUIDS - Category 4 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B	On basis of test data On basis of test data
PfuTurbo Cx Hotstart DNA Polymerase SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B	Calculation method
10X PfuTurbo Cx Reaction Buffer SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3	Calculation method Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

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