

# SAFETY DATA SHEET



PfuTurbo Cx Hotstart DNA Polymerase, Part Number 600412

## Section 1. Identification

**Product identifier** : PfuTurbo Cx Hotstart DNA Polymerase, Part Number 600412  
**Part No. (Chemical Kit)** : 600412  
**Part No.** : PfuTurbo Cx Hotstart DNA Polymerase 600412-51  
 10X PfuTurbo Cx Reaction Buffer 600410-52  
 DMSO 600260-53

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

Analytical reagent.

PfuTurbo Cx Hotstart DNA Polymerase 200 µl (500 U 2.5 U/µl)  
 10X PfuTurbo Cx Reaction Buffer 2 x 1 ml  
 DMSO 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

#### 10X PfuTurbo Cx Reaction Buffer

##### Buffer

H319 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A

##### DMSO

H227 FLAMMABLE LIQUIDS - Category 4

PfuTurbo Cx Hotstart DNA Polymerase Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%  
 10X PfuTurbo Cx Reaction Buffer Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%  
 Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 1 - 10%  
 Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 1 - 10%  
 10X PfuTurbo Cx Reaction Buffer Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 3%

### GHS label elements

#### Hazard pictograms

: 10X PfuTurbo Cx Reaction Buffer



#### Signal word

: PfuTurbo Cx Hotstart DNA Polymerase No signal word.  
 10X PfuTurbo Cx Reaction Buffer WARNING  
 Buffer WARNING  
 DMSO WARNING

## Section 2. Hazard(s) identification

<b>Hazard statements</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No known significant effects or critical hazards. H319 - Causes serious eye irritation. H227 - Combustible liquid.
<b>Precautionary statements</b>		
<b>Prevention</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer  DMSO	Not applicable. P280 - Wear eye or face protection.  P264 - Wash hands thoroughly after handling. P280 - Wear protective gloves. Wear eye or face protection. P210 - Keep away from flames and hot surfaces. - No smoking.
<b>Response</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer  DMSO	Not applicable. 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. Not applicable.
<b>Storage</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not applicable. Not applicable. P403 - Store in a well-ventilated place. P235 - Keep cool.
<b>Disposal</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not applicable. Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
<b>Supplemental label elements</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not applicable. Not applicable. Not applicable.
<b>Other hazards which do not result in classification</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	None known. None known. None known.

## Section 3. Composition and ingredient information

<b>Substance/mixture</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Mixture Mixture Substance
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### CAS number/other identifiers

## Section 3. Composition and ingredient information

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

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

- : **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. Get medical attention if irritation occurs.
- 10X PfuTurbo Cx Reaction Buffer Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Get medical attention.
- 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. Get medical attention if irritation occurs.

#### Inhalation

- : **PfuTurbo Cx Hotstart DNA Polymerase** Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- 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.
- 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.

## Section 4. First aid measures

<b>Skin contact</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
		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.
		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.
<b>Ingestion</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	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 PfuTurbo Cx Reaction 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.
		DMSO	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.

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

#### Potential acute health effects

<b>Eye contact</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
		10X PfuTurbo Cx Reaction Buffer	Causes serious eye irritation.
		DMSO	No known significant effects or critical hazards.

## Section 4. First aid measures

<b>Inhalation</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	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

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

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

<b>Notes to physician</b>	: PfuTurbo Cx Hotstart DNA Polymerase  10X PfuTurbo Cx Reaction Buffer  DMSO	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.
<b>Specific treatments</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No specific treatment. No specific treatment. No specific treatment.

## Section 4. First aid measures

<b>Protection of first-aiders</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer  DMSO	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.
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See toxicological information (Section 11)

## Section 5. Firefighting measures

### Extinguishing media

<b>Suitable extinguishing media</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use dry chemical, CO <sub>2</sub> , water spray (fog) or foam.
<b>Unsuitable extinguishing media</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	None known. None known. Do not use water jet.

### Specific hazards arising from the chemical

: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. 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.
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### Hazardous thermal decomposition products

: PfuTurbo Cx Hotstart DNA Polymerase  10X PfuTurbo Cx Reaction Buffer  DMSO	Decomposition products may include the following materials: carbon dioxide carbon monoxide Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
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## Section 5. Firefighting measures

<b>Special protective actions for fire-fighters</b>	:	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.
		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.
<b>Special protective equipment for fire-fighters</b>	:	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.
		DMSO	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

<b>For non-emergency personnel</b>	:	PfuTurbo Cx Hotstart DNA 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 spilt material. 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.
		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 personal protective equipment.
<b>For emergency responders</b>	:	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".
		DMSO	If specialised clothing is required to deal with the

## Section 6. Accidental release measures

spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

<b>Environmental precautions</b>	: 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).
	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).

### Methods and material for containment and cleaning up

<b>Methods for cleaning up</b>	: 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 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.
	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.

## Section 7. Handling and storage

### Precautions for safe handling

<b>Protective measures</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer	Put on appropriate personal protective equipment (see Section 8). 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.
	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



## Section 7. Handling and storage

<p><b>Advice on general occupational hygiene</b></p>	<p>: PfuTurbo Cx Hotstart DNA Polymerase</p> <p>10X PfuTurbo Cx Reaction Buffer</p> <p>DMSO</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p><b>Conditions for safe storage, including any incompatibilities</b></p>	<p>: PfuTurbo Cx Hotstart DNA Polymerase</p> <p>10X PfuTurbo Cx Reaction Buffer</p> <p>DMSO</p>	<p>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.</p> <p>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. Storage temperature: -20°C (-4°F). 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 oxidizing 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</p>

## Section 7. Handling and storage

environmental contamination. See Section 10 for incompatible materials before handling or use.

## Section 8. Exposure controls and personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<b>PfuTurbo Cx Hotstart DNA Polymerase</b> Glycerol	<b>Safe Work Australia (Australia, 1/2014).</b> TWA: 10 mg/m <sup>3</sup> 8 hours.
<b>DMSO</b> Dimethyl sulfoxide	<b>DFG MAC-values list (Germany, 7/2015).</b> <b>Absorbed through skin.</b> PEAK: 320 mg/m <sup>3</sup> , 4 times per shift, 15 minutes. TWA: 160 mg/m <sup>3</sup> 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours.

- 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.
- 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.

## Section 8. Exposure controls and personal protection

**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

### Appearance

<b>Physical state</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Liquid.
		10X PfuTurbo Cx Reaction Buffer	Liquid.
		DMSO	Liquid. [Clear.]
<b>Colour</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	Not available.
		DMSO	Colourless.
<b>Odour</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	Not available.
		DMSO	Odourless. [Slight]
<b>Odour threshold</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	Not available.
		DMSO	Not available.
<b>pH</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	8.2
		10X PfuTurbo Cx Reaction Buffer	8.8
		DMSO	Not available.
<b>Melting point</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	0°C (32°F)
		DMSO	18.5°C (65.3°F)
<b>Boiling point</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	100°C (212°F)
		DMSO	189°C (372.2°F)
<b>Flash point</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	Not available.
		DMSO	Closed cup: 87°C (188.6°F) Open cup: 87°C (188.6°F)
<b>Evaporation rate</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not available.
		10X PfuTurbo Cx Reaction Buffer	Not available.
		DMSO	0.026 (butyl acetate = 1)
<b>Flammability (solid, gas)</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	Not applicable.
		10X PfuTurbo Cx Reaction Buffer	Not applicable.
		DMSO	Not applicable.

## Section 9. Physical and chemical properties

<b>Lower and upper explosive (flammable) limits</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. Lower: 2.6% Upper: 28.5%
<b>Vapour pressure</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. 0.056 kPa (0.42 mm Hg) [room temperature]
<b>Vapour density</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. 2.7 [Air = 1]
<b>Relative density</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. 1.1
<b>Solubility</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water.
<b>Partition coefficient: n-octanol/water</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. -1.35
<b>Auto-ignition temperature</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. 300 to 302°C (572 to 575.6°F)
<b>Decomposition temperature</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. 140 to 189°C (284 to 372.2°F)
<b>Viscosity</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	Not available. Not available. Dynamic (room temperature): 2.14 mPa·s (2.14 cP)

## Section 10. Stability and reactivity

<b>Reactivity</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	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.
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## Section 10. Stability and reactivity

<b>Chemical stability</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	The product is stable. The product is stable. The product is stable.
<b>Possibility of hazardous reactions</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	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.
<b>Conditions to avoid</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No specific data. No specific data. 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.
<b>Incompatible materials</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. Reactive or incompatible with the following materials: oxidizing materials
<b>Hazardous decomposition products</b>	: PfuTurbo Cx Hotstart DNA Polymerase  10X PfuTurbo Cx Reaction Buffer  DMSO	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>PfuTurbo Cx Hotstart DNA Polymerase</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
<b>10X PfuTurbo Cx Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	LD50 Oral	Rat	1800 mg/kg	-
<b>DMSO</b> Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -

#### Irritation/Corrosion

## Section 11. Toxicological information

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

### Sensitisation

Not available.

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Not available.

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

<b>Information on likely routes of exposure</b>	<b>PfuTurbo Cx Hotstart DNA Polymerase</b>	Routes of entry anticipated: Oral, Dermal, Inhalation.
	<b>10X PfuTurbo Cx Reaction Buffer</b>	Routes of entry anticipated: Oral, Dermal, Inhalation.
	<b>DMSO</b>	Routes of entry anticipated: Oral, Dermal, Inhalation.

### Potential acute health effects

<b>Eye contact</b>	<b>PfuTurbo Cx Hotstart DNA Polymerase</b>	No known significant effects or critical hazards.
	<b>10X PfuTurbo Cx Reaction Buffer</b>	Causes serious eye irritation.
	<b>DMSO</b>	No known significant effects or critical hazards.

## Section 11. Toxicological information

<b>Inhalation</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
		10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
		DMSO	No known significant effects or critical hazards.
<b>Skin contact</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
		10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
		DMSO	No known significant effects or critical hazards.
<b>Ingestion</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
		10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
		DMSO	No known significant effects or critical hazards.

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

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

Not available.

<b>General</b>	:	PfuTurbo Cx Hotstart DNA Polymerase	No known significant effects or critical hazards.
		10X PfuTurbo Cx Reaction Buffer	No known significant effects or critical hazards.
		DMSO	No known significant effects or critical hazards.

## Section 11. Toxicological information

<b>Carcinogenicity</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Mutagenicity</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Teratogenicity</b>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	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>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	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>	: PfuTurbo Cx Hotstart DNA Polymerase 10X PfuTurbo Cx Reaction Buffer DMSO	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
10X PfuTurbo Cx Reaction Buffer Oral	180000 mg/kg

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
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	Crustaceans - Ceriodaphnia rigaudi - Neonate	48 hours
	Acute LC50 11.2 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 4500 µg/l Fresh water	Fish - Pimephales promelas	96 hours
DMSO Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 µl/L Marine water	Fish - Pimephales promelas Algae - Ulva lactuca	96 hours 72 hours

### Persistence and degradability



## Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>10X PfuTurbo Cx Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	-	-	Readily

### Bioaccumulative potential

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

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : 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 Annex II of Marpol and the IBC Code** : Not available.

## Section 15. Regulatory information

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

## Section 16. Any other relevant information

### History

**Date of issue/Date of revision** : 21/06/2017

**Date of previous issue** : 28/10/2015.

**Version** : 4

### Key to abbreviations

: ADG = Australian Dangerous Goods  
 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)  
 NOHSC = National Occupational Health and Safety Commission

**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
<b>10X PfuTurbo Cx Reaction Buffer</b> Eye Irrit. 2A, H319  <b>DMSO</b> Flam. Liq. 4, H227	Calculation method  On basis of test data

**References** : Not available.

✔ Indicates information that has changed from previously issued version.

**Notice to reader**

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