MATERIAL SAFETY DATA SHEET

VIVANTIS TECHNOLOGIES SDN BHD
REVONGEN CORPORATION CENTER

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SECTION 1: CHEMICAL IDENTIFICATION

Catalogue Number: PL3201; PL3202; PL3205; PL3206; PLMM02
Product Name: At*Taq* DNA Polymerase; Chromo At*Taq* DNA Polymerase; 2X At*Taq* Master Mix

Intended Use:
For research use only. Not for use in diagnostic procedures.

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SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%
Taq DNA Polymerase Glycerol	56-81-5	≤30
10X ViBuffer A / 10X ViBuffer S Magnesium Chloride Potassium Chloride Tris Triton X-100	 7791-18-6 7440-09-7 77-86-1 9002-93-1	 ≤1 <10 <1 <1
50mM $MgCl_2$ Magnesium Chloride	7791-18-6	0.1-1.0

SECTION 3: HAZARDS IDENTIFICATION

Classification of the substance or mixture

Not classified.

Taq DNA Polymerase	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%
10X ViBuffer A / 10X ViBuffer S / 50mM $MgCl_2$ (*Taq* Polymerase 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 ViBuffer A / 10X ViBuffer S / 50mM $MgCl_2$ (*Taq* Polymerase Buffer)	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 1.6%

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GHS label elements, including precautionary statements

Signal word:

Taq DNA Polymerase	No signal word
Taq Polymerase Buffer	No signal word

Hazard statements

Taq DNA Polymerase	No known significant effects or critical hazards.
Taq Polymerase Buffer	No known significant effects or critical hazards.

Precautionary statements

Taq DNA Polymerase & *Taq* Polymerase Buffer

Prevention:	Not applicable
Response:	Not applicable
Storage:	Not applicable
Disposal:	Not applicable
Supplemental label elements:	Not applicable

SECTION 4: FIRST-AID MEASURES

In case of eye contact, immediately flush with copious amounts of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

In case of skin contact, immediately wash with copious amounts of water. Get medical attention if symptoms occur.

In case of inhalation, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

In case of ingestion, 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.

Notes to physician:

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

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Specific treatments:

Taq DNA Polymerase	No specific treatment.
Taq Polymerase Buffer	No specific treatment.

Protection of first-aiders:

Taq DNA Polymerase	No action shall be taken involving any personal risk or without suitable training.
Taq Polymerase Buffer	No action shall be taken involving any personal risk or without suitable training.

SECTION 5: FIRE FIGHTING MEASURES

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and fully protective gear.

For special firefighting procedures, wear self-contained breathing apparatus for firefighting if necessary

Hazardous decomposition products formed under fire conditions:

Taq DNA Polymerase	Carbon dioxide, carbon monoxide.
Taq Polymerase Buffer	Carbon dioxide, carbon monoxide, nitrogen oxides, halogenated compounds, metal oxide/oxides.

Flash point:	No data available.
Explosion data – sensitivity to mechanical impact:	No data available.
Explosion data – sensitivity to static discharge:	No data available.

Specific hazards arising from the chemical:

Taq DNA Polymerase	In a fire or if heated, a pressure increase will occur, and the container may burst.
Taq Polymerase Buffer	In a fire or if heated, a pressure increase will occur, and the container may burst.

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SECTION 6: ACCIDENTAL RELEASE MEASURES

For personal precautions, 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

For cleaning up, stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, 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.

For environmental precautions, 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).

SECTION 7: HANDLING AND STORAGE

Handle 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, 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.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Components	Country	Control parameters
Taq DNA Polymerase (Glycerol)	Australia	TWA: 10 mg/m^3 8 hours

Eye/Face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Body protection	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
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.

Use engineering measures such as general ventilation to control worker exposure to airborne contaminants.

For 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.
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.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless (PL3201, PL3202); Purple (PL3205, PL3206)
Physical state:	Liquid
Odor:	Odorless
Odor threshold:	Not available
Density:	Not available
pH:	pH 6-8 (*Taq* DNA Polymerase)
Melting point:	Not available
Freezing point:	Not available
Initial Boiling point:	Not available
Boiling point:	Not available
Flash point:	Not available
Autoignition temperature:	No data available
Decomposition temperature:	No information available
Upper Flammability limit in air:	No data available
Lower Flammability limit in air:	No data available
Explosive properties:	No information available
Oxidizing properties:	No information available
Solubility:	Soluble in cold water and hot water (*Taq* DNA Polymerase); easily soluble in cold water and hot water (*Taq* Polymerase Buffer)
Partition coefficient (n-octanol/water):	No data available

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Vapor pressure:	No data available
Vapor density:	No data available
Evaporation rate:	No data available
Specific gravity:	No data available
Viscosity:	No information available

SECTION 10: STABILITY AND REACTIVITY

Stable under recommended storage conditions.

Materials to avoid:	May react or be incompatible with oxidizing materials.
Hazardous decomposition products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization:	No data available.
Conditions to avoid:	No specific data.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity

Taq DNA Polymerase (Glycerol)

Oral LD50:	Rat – 12600 mg/kg
Inhalation LC50:	No data available
Dermal LD50:	No data available
Skin irritation:	Rabbit – Mild – 500 mg – 24 hrs
Eye irritation:	Rabbit – Mild – 500 mg – 24 hrs
Respiratory or skin sensitization:	No data available
Mutagenicity:	No data available
Reproductive toxicity:	No data available
Teratogenicity:	No data available
Aspiration hazard:	No data available
Synergistic effects:	No data available
STOT – single exposure:	No data available
STOT – repeated exposure:	No data available
Carcinogenicity:	No data available
Likely routes of exposure:	Oral, dermal, inhalation.

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Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	No specific data.
Skin contact	No specific data.
Eyes contact	No specific data.
Ingestion	No specific data.

Chronic toxicity

No known significant effects or critical hazards.

To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Taq DNA Polymerase (Glycerol)

LC50: Fish – Oncorhynchus mykiss – 54000 mg/L – 96 hrs

Partition coefficient	Unit
-1.76	Log P_{ow}

Persistence and degradability:	Not available
Bioaccumulative potential:	Low
Mobility in soil:	Not available
Other adverse effects:	No known significant effects or critical hazards.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose waste material in accordance with federal, state and local environmental regulations.
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.
For waste packaging, recycle otherwise landfill or incineration if recycling is not feasible.
Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

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SECTION 14: TRANSPORT INFORMATION

ADG

Not regulated as Dangerous Goods according to the ADG code.

IMDG

Not regulated as Dangerous Goods according to the ADG code.

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

Not regulated.

Model Work Health and Safety Regulations – Scheduled Substances

No listed substance.

International regulations

Chemical Weapon Convention List Schedule 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

Australia:	All components are listed or exempted.
Canada:	All components are listed or exempted.
China:	All components are listed or exempted.
Europe:	All components are listed or exempted.
Japan:	Japan inventory (ENCS): Not determined. Japan inventory (ISHL): Not determined.
Malaysia:	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 listed or exempted.
Viet Nam:	Not determined.

SECTION 16: OTHER INFORMATION

The information contained in this MSDS relates only to the material(s) designed and does not relate to use(s) in combination with any other material, process(es) and /or chemical reaction(s). Vivantis Technologies Sdn. Bhd. provides this information in good faith, from sources believed to be accurate; however, Vivantis assumes no liability for its accuracy or completeness, and thus shall not be held liable for any damage resulting from handling or from contact with the above product.

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