Catalog #	Aliquot Size
TQ02-E012-5	5 mL
TQ02-E012-15	15 mL
TQ02-E012-50	50 mL

Taq Plus Master Mix (Dye Plus)

Catalog # TQ02-E012
Lot # E4333-4

Product Description

Taq Plus Master Mix (Dye Plus) is a special premix for PCR. This product contains 2X master mix to which primers and template can be added. It also contains electrophoresis buffer and dyes, so the product can be directly electrophoresed after the reaction. This reduces pipetting operations and improves detection throughput and results reproducibility, and is convenient to use.

Formulation

This master mix contains Taq Plus DNA Polymerase, dNTP, dyes and an optimized buffer system, in a proprietary formulation.

Storage and Stability

Store at -30 to -15 °C protected from light.

Scientific Background

Compared to Taq DNA Polymerase, Taq Plus Master Mix (Dye Plus) has higher fidelity, stronger amplification performance and yield. It can be used for PCR amplification of animal, plant and microbial DNA within 10 kb using genome as template and PCR amplification within 15 kb using plasmid and λDNA as template. A protective agent in the buffer system allows 2 × Master Mix to maintain stable activity after repeated freezing and thawing. The PCR product generated has A-tailing at the 3' end, which can be cloned into T vectors.

This product is manufactured in an ISO 9001 and ISO 13485 certified facility

Taq Plus Master Mix (Dye Plus)

Catalog #	TQ02-E012
Lot #	E4333-4
Storage & Shipping	Store at -30 to -15 °C protected from light. Transport at ≤0 °C. For optimal storage and performance aliquot product into smaller quantities after centrifugation and store at recommended temperature. Avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

To place your order, please contact us by phone 1-(604)-232-4600, fax 1-604-232-4601
or by email: orders@signalchem.com or IVD@signalchem.com - www.signalchem.com

PCR Protocol

Guidelines for primer design:

1. It is recommended that the last base at the 3' end of primer should be G or C.
2. Consecutive mismatches should be avoided in the last 8 bases at the 3' end of the primer.
3. Avoid hairpin structures at the 3' end of the primer.
4. Differences in the Tm value of the forward primer and the reverse primer should be no more than 1°C and the Tm value should be adjusted to 55 ~ 65°C (Primer Premier 5 is recommended to calculate the Tm value).
5. Extra additional primer sequences that are not matched with the template, should not be included when calculating the primer Tm value.
6. Control the GC content of the primer to be 40% - 60%.
7. The overall distribution of A, G, C and T in the primer should be as even as possible. Avoid using regions with high GC or AT contents.
8. Avoid the presence of complementary sequences of 5 or more bases either within the primer or between two primers and avoid the presence of complementary sequences of 3 or more bases at the 3' end of two primers.
9. Use the NCBI BLAST function to check the specificity of the primer to prevent non-specific amplification.

Protocol:

1. General reaction mixture for PCR:

Component	50 µl system
2 × Taq Plus Master Mix	25 µl
Primer 1 (10 µM)	2 µl
Primer 2 (10 µM)	2 µl
Template DNA*	Variable
ddH_2O	to 50 µl

* The optimal reaction concentration is different for different templates. The following table shows the recommended template usage for a 50 µl reaction system:

DNA template	Amount
Genomic DNA of animals and plants	0.1-1µg
Escherichia coli genomic DNA	10-100ng
cDNA	1 - 5 µl
λDNA	0.5-10ng
Plasmid DNA	0.1-10ng

2. Thermocycling conditions for a routine PCR:

Temperature	Time	Cycle number
95°C	3 min (Initial denaturation)[a]	
95°C	15 sec	30-35 cycles
60°C [b]	15 sec	
72°C	60 sec / kb	
72°C	5 min (Final extension)	

a. The initial denaturation conditions are suitable for most amplification reactions and can be adjusted according to the complexity of the template structure. If the template structure is complex, the initial denaturation time can be extended to 5 - 10 min to improve the initial denaturation effect.

b. The annealing temperature needs to be adjusted according to the Tm value of the primer, generally set to be 3 ~ 5℃ lower than the Tm value of the primer; For complex templates, it is necessary to adjust the annealing temperature and extend the extension time to achieve efficient amplification.

FAQ & Troubleshooting:

	No amplification products or low yield	Unspecific products or smear bands
Primer	Optimize primer design	Optimize primer design
Annealing temperature	Set temperature gradient and find the optimal annealing temperature	Try to increase the annealing temperature to 65°C at 2°C intervals
Primer concentration	Increase the concentration of primers properly	Decrease the final concentration of primer to 0.2 µM
Extension time	Increase the extension time properly	Reduce the extension time when there are unspecific bands larger than the target bands
Cycles	Increase the number of cycles to 35 - 40 cycles	Reduce the number of cycles to 25 - 30 cycles
Template purity	Use templates with high purity	Use templates with high purity
Input amounts of template	Crude samples may need to be reduced in usage; Refer to the recommended amount of the reaction system and increase in moderation	Adjust the dosage according to the recommended amount of the reaction system

To place your order, please contact us by phone 1-(604)-232-4600, fax 1-604-232-4601
or by email: orders@signalchem.com or IVD@signalchem.com - www.signalchem.com

SAFETY DATA SHEET

Article 1 - Product Identification

Product Name: Taq Plus Master Mix (Dye Plus) **Catalog # TQ02-E012**

This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.

Manufacturer's Name:	SignalChem Biotech Inc.
Street Address:	*110-13120 Vanier Place*
City, Prov. Postal Code:	*Richmond, BC, V6V 2J2*
Country:	*Canada*
Fax:	604-232-4601
EMERGENCY PHONE:	604-232-4600

Article 2 - Hazard Identification

- **WHMIS Classification:** Not WHMIS controlled.
- **GHS classification:** Not GHS classified.
- **Hazard Pictograms:** No labeling applicable.
- **Signal words:** None.
- **Hazard statements:** None.
- **Other hazards:** May cause eye and skin irritation. May cause respiratory and digestive tract irritation.
- **Precautionary statements:** Wear protective gloves/protective clothing/eye protection/ face protection. Avoid breathing dust. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Article 3 – Composition/Information on Ingredients

Chemical Characterization: Mixture.
Description: The components of this product which may be hazardous are listed below.

Common name	Chemical name	CAS-No.	Concentration
Glycerol	Glycerol	56-81-5	35%-70%

Article 4 – First-aid Measures

- **General information:** Consult a physician and provide this SDS.
- **After inhalation:** In case of irritation by inhaling this product, move affected person to fresh air and await recovery. If irritation persists, seek immediate medical attention.
- **After skin contact:** Wash with clean water, immediately.
- **After eye contact:** Flush eyes with clean water for more than 15 minutes and seek medical attention.
- **After swallowing:** Induce vomiting. If indisposition continues, seek medical attention.

Article 5 - Fire-fighting Measures

- **Suitable extinguishing media:** Water, Carbon Dioxide, Foam, Dry Chemical Powder
- **Specific hazards arising from the substance or mixture:** None known.
- **Special protective equipment and precautions for fire-fighters:** Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

SAFETY DATA SHEET

Article 6 – Accidental Release Measures

- **Personal precautions, protective equipment, and emergency procedures:** Avoid substance contact.
- **Environmental precautions:** Do not discharge directly into sewers.
- **Methods and materials for containment and cleaning up:** Sweep up, place in a bag, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Article 7 - Handling and Storage

- **Precautions for safe handling:** Wear protective equipment and avoid contact with eyes and skin. Handle with ventilation and local exhaust system.
- **Conditions for safe storage:** Store in a dry and well-ventilated place at temperatures recommended on product datasheet. Keep container upright and tightly closed.

Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:**
  Glycerol (CAS-No: 56-81-5)

Values	Control parameters	Regulations
TWA	10 mg/m³ for mist	British Columbia, Canada
TWA	3 mg/m³ for respirable mist	British Columbia, Canada
TWA	10 mg/m³	Alberta, Canada
TWAEV	10 mg/m³	Ontario, Canada
TWAEV	10 mg/m³	Quebec, Canada
TWA	10 mg/m³	USA

- **Appropriate engineering controls:**
  Set up good ventilation and exhaust system in the work area.
- **Individual protection measures:**

Respiratory protection:
No special protective equipment required. If ventilation is poor, wear respirators that are suitable according to government standards.

Hand protection:
Wear gloves and use proper glove removal technique to avoid skin contact. Discard gloves after use by following the applicable laboratory regulations. Wash and dry hands.

Eye/face protection:
Safety goggles with side-shields approved under appropriate government standards.

Skin/body protection:
Use appropriate clothing, footwear and any additional protection measures to protect from splashing or contamination.

Article 9 – Physical and Chemical Properties

Appearance: Purple Liquid.	**Danger of explosion:** Product does not present an explosion hazard.
Odour/Odour Threshold: None.	**Explosion limits:** Not determined
pH: Not determined.	**Decomposition temperature:** Not determined.
Melting point/freezing point: Not determined.	**Vapor pressure at 20 °C:** Not determined.
Boiling point/Boiling range: Not determined.	**Density:** Not determined.
Flash point: Not determined.	**Relative density:** Not determined.
Flammability (solid, gaseous): Not determined.	**Vapor density:** Not determined.
Ignition temperature: Not determined.	**Evaporation rate:** Not determined.
Auto-igniting: Product is not self-igniting.	**Solubility in / Miscibility with Water:** Soluble in water.

Article 10 - Stability and Reactivity

- **Reactivity:** Stable under recommended transport and storage conditions.
- **Chemical stability:** Stable under recommended transport and storage conditions.
- **Possible hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** Heat and moisture.
- **Incompatible materials:** Strong acids/bases, strong oxidizing agents.
- **Hazardous decomposition products:** Not available.

SAFETY DATA SHEET

Article 11 - Toxicological Information

- **Acute toxicity:** Not available.
- **LD/LC50:** Not available.
- **Skin corrosion/irritation:** Not available.
- **Serious eye damage/eye irritation:** Not available.
- **Respiratory or skin sensitization:** Not available.
- **Germ cell mutagenicity:** Not available.
- **Carcinogenicity:** No components are listed in IARC, or NTP, or OSHA, or ACGIH.
- **Reproductive toxicity:** Not available.
- **Teratogenicity:** Not available.
- **Specific target organ toxicity - single exposure/ - repeated exposure (GHS):** Not available.
- **Aspiration hazard:** Not available.
- **Potential health effects:**
  Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
  Ingestion: May be harmful if swallowed. May cause digestive tract irritation.
  Skin: May cause skin irritation.
  Eyes: May cause eye irritation.
- **Signs and Symptoms of Exposure:** Not available.
- **Synergistic effects:** Not available.

Article 12 - Ecological Information

- **Eco-toxicity:** No data available.
- **Biodegradability:** No data available.
- **Bio-accumulative potential:** No data available.
- **Mobility in soil:** No data available.
- **PBT and vPvB assessment:** No data available.
- **Other adverse effects:** No data available.

Article 13 - Disposal Considerations

- **Disposal methods:** In accordance to applicable national, regional, or local laws and regulations. For additional handling information and protection of employees please refer to Article 7 and 8.
- **Contaminated packaging:** Disposal should be made in accordance to applicable national, regional, or local laws and regulations.

Article 14 - Transport Information

- **DOT:** Not dangerous goods.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

Article 15 – Regulatory Information

- **WHMIS Classification:** Non-hazardous.
- **GHS label elements:** Not applicable.
- **Signal word:** Not applicable.
- **Hazard statements:** Not applicable.

Article 16 - Other Information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. SignalChem shall not be held liable for any damage resulting from handling or from contact with the above product. See the Technical Specification, Packing Slip, Invoice, and Product Catalog for additional terms and conditions of sale.