Concentration:

Taq DNA Polymerase: 5U/µl
Reaction ($MgCl_2$) Buffer: 10X
Reaction (No MgCl2) Buffer: 10X
Magnesium Chloride: 25mM.

Storage and Handling:

Upon arrival store at -20°C for provided expiration date.

Product Description:

Taq DNA Polymerase:
Thermo stable enzyme gene isolated from *Thermus aquaticus* YT1 and expressed in *E.coli*. The enzyme consists of a single polypeptide with a molecular weight of 94 kDa. Taq DNA Polymerase possess a 5' → 3' polymerase activity, endonuclease activity, and will synthesize DNA products having dA overhangs on the 3' ends. Empirical Taq DNA Polymerase is supplied in a storage buffer containing: HEPES, KCl, EDTA, DTT, Glycerol, and other stabilizers.

10X Reaction ($MgCl_2$) Buffer:
Specially optimized reaction buffer containing: Tris-HCl (pH 8.4), KCl, and $MgCl_2$. This Buffer is supplied in a 10X concentration and should be diluted for use.

10X Reaction (No $MgCl_2$) Buffer:
Specially optimized reaction buffer containing: Tris-HCl (pH 8.4), and KCl. This Buffer is supplied in a 10X concentration and should be diluted for use.

25mM $MgCl_2$:
25 mM Magnesium Chloride.

Protocol:

The following reaction setup and general cycling conditions are recommended but can vary depending on the template and primers being used. The following set up is for a 20µl reaction size.

Option A: Reaction Set-Up for a 50uL Reaction with 10X Reaction ($MgCl_2$) Buffer:

Component	Volume	Final Concentration
10X Reaction ($MgCl_2$) Buffer	5 µl	1X
Upstream Primer, 10µM	1.0-5.0 µl	0.2-1.0µM
Downstream Primer, 10µM	1.0-5.0 µl	0.2-1.0µM
dNTP, 10mM	1-4 µl	200-800µM
DNA Template	X µl	>0.5ng DNA
Taq DNA Polymerase, 5U/µl	0.2-1 µl	1U-5U
Nuclease Free Water to Volume	to 50 µl	N.A.

***This product is intended for Research Use Only. This product is manufactured under ISO13485:2016 Quality System Requirements and is available for use as a Raw Material for use in IVD applications. Please contact Empirical Bioscience for further details.**

Option B: Reaction Set-Up for a 50uL Reaction with 10X Reaction (No $MgCl_2$) Buffer and 25mM $MgCl_2$:

Component	Volume	Final Concentration
10X Reaction (No $MgCl_2$) Buffer	5 µl	1X
25mM Magnesium Chloride	X µl	As desired
Upstream Primer, 10µM	1.0-5.0 µl	0.2-1.0µM
Downstream Primer, 10µM	1.0-5.0 µl	0.2-1.0µM
dNTP, 10mM	1-4 µl	200-800µM
DNA Template	X µl	>0.5ng DNA
Taq DNA Polymerase, 5U/µl	0.2-1 µl	1U-5U
Nuclease Free Water to Volume	to 50 µl	N.A.

Thermal cycling conditions: The following general cycling conditions are recommended but can vary depending on the template and primers being used.

Cycling Step	Temperature	Holding Time	Cycles
Initial Denaturation	95˚C	2min	1
Denaturation	94-96˚C	15 - 30sec	20-30
Annealing#	55-65˚C	15 - 60sec	
Extension	70-72˚C	1min/kb	
Final Extension	70-72˚C	0-10min	1

#Annealing will depend on primer length and composition. Generally, begin 5˚C below primer T_m.

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