Taq DNA Polymerase

Cat. No.: FP1508912 | Pack size: 1 KU / 10 KU | Storage: -20 °C

Overview

Taq DNA Polymerase is a thermostable DNA polymerase derived from Thermus aquaticus and obtained by recombinant expression and purification. The enzyme is widely used for PCR amplification and related molecular biology workflows.

PCR products generated with this enzyme typically contain an additional adenine residue at the 3' end, allowing direct cloning into T-vectors. The supplied 5× Taq Buffer (Mg^{2+} Plus) provides a final Mg^{2+} concentration of 2 mM when used as recommended.

Key Features

- Recombinant thermostable Taq DNA polymerase for routine PCR and qPCR applications
- Supplied at 5 U/μL with 5× Taq Buffer (Mg^{2+} Plus)
- Adds a 3'-A overhang to amplified PCR products for T-vector cloning workflows
- Exhibits polymerase and 5'-3' exonuclease activity; lacks 3'-5' proofreading exonuclease activity
- Suitable for molecular biology DNA and RNA applications

Product Specifications

Parameter	Specification	Notes
Product name	Taq DNA Polymerase	Thermostable DNA polymerase
Cat. No.	FP1508912	Available pack sizes: 1 KU and 10 KU
Grade & purity	Recombinant; Suitable for molecular biology; EnzymoPure™; for DNA and RNA applications	Supplied enzyme concentration: 5 U/μL
CAS Number	9012-90-2	Product page identifier
Activity profile	Polymerase activity and 5'-3' exonuclease activity	No detected 3'-5' proofreading activity
Application	PCR; qPCR	Optimize reaction conditions by template and primer design

Parameter	Specification	Notes
Storage conditions	Store at -20 °C; avoid repeated freezing and thawing	Aliquot upon receipt if repeated use is expected
Shipping	Ice chest + ice pads	Store at -20 °C immediately upon receipt

Product Contents & Storage

Cat. No.	Component	1 KU	10 KU	Storage
FP1508912A	Taq DNA Polymerase (5 U/μL)	200 μL	2 × 1.0 mL	-20 °C
FP1508912B	5× Taq Buffer (Mg^{2+} Plus)	4 × 1.0 mL	40 mL	-20 °C

Shelf life: Store at -20 °C long term. Upon receipt, aliquot when repeated use is expected.

Note: *Avoid repeated freeze/thaw cycles. Keep enzyme on ice during reaction setup and return to -20 °C after use.*

Materials Required But Not Supplied

Item	Recommended Specification	Purpose
Template DNA	Genomic DNA, plasmid DNA, or other validated template	PCR template
dNTP mix	2.5 mM each	DNA synthesis substrates
Forward and reverse primers	10 μM working solutions	Target amplification
ddH_2O	DNase-free / nuclease-free	Reaction volume adjustment
PCR tubes or plates	Compatible with thermal cycler	Reaction vessel
Thermal cycler	Validated for PCR cycling	PCR amplification
Agarose gel system	With appropriate DNA stain/ladder	PCR product analysis

Preparation Before Use

1. Thaw required reagents at room temperature or 2-8 ℃, mix thoroughly by gentle inversion, and keep on ice.
2. Prepare the reaction system on ice or in an ice box.
3. Avoid vigorous shaking. Mix gently by pipetting or brief vortexing, then centrifuge briefly to collect liquid at the bottom of the tube.
4. For repeated use, aliquot reagents to minimize freeze/thaw cycles.

Protocol

Step 1 — PCR Reaction Setup (50 µL)

Recommended template amounts in a 50 µL reaction: mammalian genomic DNA 0.1-1 µg; E. coli genomic DNA 10-100 ng; plasmid DNA 0.1-10 ng.

Component	Added Volume	Final Concentration
5× Taq Buffer (Mg^{2+} Plus)	10 µL	1×
dNTPs (2.5 mM each)	0.4 µL	0.2 mM
Forward Primer (10 µM)	1 µL	0.2 µM
Reverse Primer (10 µM)	1 µL	0.2 µM
Taq DNA Polymerase (5 U/µL)	0.5 µL	2.5 U/50 µL
Template DNA	10 µL	-
ddH_2O	To 50 µL	-
Final Volume	50 µL	-

Step 2 — Conventional Qualitative PCR Program

Step Name	Temperature	Time	Cycles
Heat Shock	95 ℃	2 min	1
Denaturation	95 ℃	30 sec	25-35
Annealing	55 ℃	30 sec	25-35
Extension	72 ℃	1 min	25-35
Final Extension	72 ℃	7 min	1

Note: *Program shown is for a 1 kb target fragment. Adjust temperature, time, and cycle number according to template, primer Tm, amplicon length, and GC content.*

Step 3 — Extension-Time Adjustment

Set extension time according to PCR product length. A typical starting point is 1 min per kb. For example, use 1 min for a 1 kb product and 2 min for a 2 kb product.

Step 4 — Primer Design Guidelines

- Prefer G or C at the 3'-end of the primer when feasible.
- Avoid consecutive mismatches within the final 8 bases at the 3'-end.
- Avoid hairpin structures and primer-primer complementarity, especially at 3'-ends.
- Maintain primer GC content between 40% and 60%; recommended Tm is 55-65 ℃.
- Verify primer specificity using NCBI BLAST or an equivalent tool.

Safety & Precautions

- Use nuclease-free tubes, tips, and water for all PCR setup steps.
- Set up negative controls for new assays or when contamination is suspected.
- For first-time PCR, 35 cycles can be used to maximize the chance of detecting the expected product; semi-quantitative or quantitative experiments require cycle optimization.
- Read the current SDS before use and handle reagents according to laboratory safety procedures.

Quality Control

QC Item	Method	Acceptable Range
Component completeness	Visual inspection on receipt	Components, labels, pack size, lot number, and expiry information match the product contents table
Enzyme concentration	Approved product specification and activity assignment	Taq DNA Polymerase supplied at 5 U/μL
Functional performance	PCR/qPCR amplification with qualified template	Expected amplification in positive reactions; no amplification in appropriate negative controls
Nuclease status	DNase/RNase functional testing where applicable	Meets approved specification for molecular biology applications

QC Item	Method	Acceptable Range
Storage verification	Review receipt condition and storage record	Cold-chain shipment received intact and stored at -20 °C immediately

Troubleshooting

Issue	Possible Causes	Corrective Action
No or weak amplification	• Template quantity or quality not suitable • Missing component or incorrect reaction setup • Annealing temperature or Mg^{2+} concentration not optimized • Enzyme damaged by improper storage	• Verify template integrity and amount • Check reaction setup against the table • Optimize annealing temperature and Mg^{2+} concentration • Use fresh aliquots and avoid repeated freeze/thaw cycles
Nonspecific bands or smearing	• Primer specificity is poor • Template amount too high • Annealing temperature too low • Too many cycles or excess enzyme	• Redesign primers and verify with BLAST • Reduce template input • Increase annealing temperature or use hot-start workflow • Reduce cycle number or enzyme amount after validation
Primer-dimer formation	• Complementarity at primer 3'-ends • Primer concentration too high • Room-temperature setup before hot-start activation	• Redesign primers to reduce 3'-end complementarity • Reduce primer concentration within validated range • Assemble reactions on ice and start cycling promptly
Poor qPCR baseline or fluorescence	• Probe or dye degradation • Incorrect ROX setting or acquisition step • Inhibitory template matrix	• Protect fluorescent reagents from light • Verify instrument dye/ROX settings and acquisition step • Dilute template or improve sample cleanup

Recommended Applications

Routine PCR · qPCR assay development · T-vector cloning workflows · molecular biology amplification

Contact & Global Offices

Whether you have a technical question, need help with a quotation, or want to inquire about an order, our regional teams are ready to assist. Please contact the office for your region; for general inquiries, the North American office is the corporate primary.

NORTH AMERICAN SALES, SUPPORT & GENERAL INQUIRIES

Aladdin Scientific Corporation

14078 Meridian Parkway, Riverside, CA 92518, USA

Phone: 1-833-552-7181

Sales: sales@aladdinsci.com

Customer Service: custserv@aladdinsci.com

EU SALES, LOGISTICS & LOCALIZED SUPPORT

Aladdin Biochem Deutschland GmbH

Westring 2, 33142 Büren, Germany

Phone: +02951 9383958

Support: support.eu@aladdinsci.com

Limitations & Disclaimer

- For Research Use Only (RUO). Not for use in human or animal diagnostics, therapeutics, or in vivo applications. Not for food, cosmetic, or household use.
- This product is not a CE-marked in vitro diagnostic device under IVDR (EU) 2017/746 and is not an FDA-cleared device under 21 CFR. Use is restricted to verified businesses, institutions, and qualified professionals for research and development purposes.
- Where any component is classified as hazardous under CLP (EC) 1272/2008 or OSHA HCS (29 CFR 1910.1200), the product Safety Data Sheet (SDS) takes precedence over this document for handling, storage, and disposal information.
- Performance depends on sample quality, assay design, reaction setup, instrument settings, and operator technique. Users are responsible for validating the product for their specific application.
- Aladdin product labels, SDS, COA, and approved specifications take precedence over this document. If product formulation, label, SDS, storage conditions, pack size, or quality specifications change, this document would be reviewed and reissued.