Taq DNA Polymerase

With dNTP Mix: **9K-001-0031 (500U) / 9K-001-0034 (1000U) / 9K-001-0032 (3000U) / 9K-001-0018 (6000U)**

Without dNTP Mix: **9K-001-0001 (500U) / 9K-001-0035 (1000U) / 9K-001-0002 (3000U) / 9K-001-0033 (6000U)**

store at -20°C

. Taq DNA Polymerase (5U/µl)
. 10x Taq reaction Buffer
. 10 mM dNTP Mix (each 10mM) *with 9K-001-0031 / 9K-001-0032 / 9K-001-0018
. Band Sharpener

Protocols

The recommended protocol for reaction mixture and temperature cycle in PCR is as below. You may modify the amount of template and Taq DNA polymerase, extension time, annealing temperature, and cycle number according to the product size, primer Tm value, and template type.

Reaction mixture (for 50µl reaction)

10X Taq buffer	5.0 µl
10mM dNTP mix	1.0 µl
primer 1(10pmole/µl)	2.0 µl
primer 2(10pmole/µl)	2.0 µl
template	X µl
Band Sharpener	0~20 µl
Taq DNA Polymerase (5U/µl)	0.25 µl
D.W. to	50.0 µl

Temperature cycle

95℃ 2 min		x1
95℃ 20 sec		x10~40
AT* 40 sec		
72℃ 1 min/kb		
72℃ 5 min		x1

AT*: Annealing Temperature

Adjust to the lower Tm between two primers

AT = Tm-(4~6℃) Tm = 2℃x(A+T)+4℃x(G+C)

Source	Thermus aquaticus (Recombinant)	Amplicon size	~ 5 kb
		Hot start activity	No
5′ → 3′ exonuclease activity	Yes	3′ A or Blunt ends	3' A
3′ → 5′ exonuclease activity	No	Error rate	12-13 bp error / 10^6 bp

*It might be required to optimize PCR conditions depending on target size, Tm of primers, template nature, extension time, annealing temperature, enzyme quantity and cycle(s) numbers.

Technical Information

A. Template (temperature cycle)

. Animal genomic DNA
  50-200 ng (25-35 cycles)
  10-50 ng (30-40 cycles)
. Bacterial genomic DNA
  10-50 ng (20-25 cycles)
  1-5 ng (30-35 cycles)
. Plasmid and lamda DNA
  1-5 ng (20-30 cycles)

B. Taq DNA Polymerase

1.25unit(0.25µl) per 50µl reaction is recommended when amplifying animal genomic DNA.
Please use 2~2.5 unit in case target size is >3kb.
In case the target is >3kb, we recommend LR Polymerase (9K-001-0008).

C. Band Sharpener*

Band Sharpener **is not necessary for regular PCR conditions**. In case fragment include high GC region or hard to amplify complex secondary structures, please add Band Sharpener to a final concentration of 0.5x~2x (5-20µl for 50µl reaction) to reaction mixture, as optimization is required (see protocol below).

D. Primer design

- Primer can be designed using a primer design software or manually.
- Avoid repeated sequence at 3' end.
- In case 3'-end is G+C rich, the end have to be A or T.
- In case 3' end is A+T rich, the end have to be G or C.
- It is recommended that Tm of the designed primers is >64℃ and AT >58℃.

E. Extension time

- In general, extension should be performed at 0.5~1.0min/kb
- If the amplification for more than 3 kb, extension should be performed at 1.0~2.0 min/kb
- If the amplification for more than 5 kb, extension temperature should be assigned 68℃.

Band Sharpener Optimization protocol

Reaction mixture (Conc. of Band Sharpener)	Mix I (0.0 x)	Mix II (0.5x)	Mix III (1.0x)	Mix IV (1.5x)	Mix V (2.0 x)
10X Taq buffer	5.0 µl	5.0 µl	5.0 µl	5.0 µl	5.0 µl
10mM dNTP mix	1.0 µl	1.0 µl	1.0 µl	1.0 µl	1.0 µl
Primer 1 (10pmole/µl)	2.0 µl	2.0 µl	2.0 µl	2.0 µl	2.0 µl
Primer 2 (10pmole/µl)	2.0 µl	2.0 µl	2.0 µl	2.0 µl	2.0 µl
Template	X µl	X µl	X µl	X µl	X µl
Band Sharpener	0 µl	5.0 µl	10.0 µl	15.0 µl	20.0 µl
Taq (5U/µl)	0.25 µl	0.25 µl	0.25 µl	0.25 µl	0.25 µl
Add D.W. to	50.0 µl	50.0 µl	50.0 µl	50.0 µl	50.0 µl

*** Note:** Band Sharpener included in the Kit is provided for PCR optimization purpose only. If your optimized PCR conditions include Band Sharpener, please order cat#: 9K-001-007.