



SMOBIO

Small Bio, Smart Tool

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Product Information

G-HiFi™ DNA Polymerase

TF3000 100 units

G-HiFi™ DNA Polymerase (1 U/μl)	100 μl
5X G-HiFi™ Buffer	1200 μl
dNTPs Mix (2 mM each)	600 μl

Storage

-20°C for 24 months

Applications

- Long range PCR amplification
- PCR for DNA sequencing
- Generates blunt end amplicons for cloning with GetClone™ PCR cloning vector
- Amplification of GC-rich templates

Description

The G-HiFi™ DNA Polymerase is a new genetically modified, recombinant DNA polymerase suitable for GC-rich templates that are difficult to amplify. The fidelity of G-HiFi™ DNA Polymerase is 70 times higher than that of *Taq* DNA polymerase. The high extension rate of G-HiFi™ DNA Polymerase is achieved by blending the DNA polymerase with an elongation enhancer. The optimized 5X G-HiFi™ Buffer includes special components that suppress non-specific amplification as well as plateau effect produced by conventional PCR. With the optimized 5X G-HiFi™ Buffer, G-HiFi™ DNA Polymerase is capable to amplify most templates, such as longer targets (up to 40 kb from lambda DNA) and that contain GC-rich sequences.

Features

- 5'→3' DNA polymerase activity
- 3'→5' exonuclease (proofreading) activity
- Suitable for GC-rich templates
- High reaction rate: 7 seconds/kb
- High fidelity: 70 times higher than *Taq* polymerase
- Generates blunt end amplicons
- Vast elongation capability (up to 40 kb)
- Thermo-stable for more than 10 hrs at 95°C.

Storage Buffer

50 mM Tris-HCl (pH 8.0), 50 mM KCl, 0.1 mM EDTA, 1 mM DTT, stabilizer, 50% (v/v) glycerol

Unit Definition

One unit is defined as the amount of enzyme that will incorporate 10 nmol of dNTP into acid-insoluble material in 30 minutes at 74°C.

Recommended PCR Condition

Template	10 – 150 ng
Forward primer	0.1 – 0.5 μM *
Reverse primer	0.1 – 0.5 μM *
5X G-HiFi™ Buffer	10 μl
dNTPs (2 mM each)	5 μl
G-HiFi™ DNA Polymerase	0.5 – 1 unit**
H ₂ O	to 50 μl
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Total volume	50 μl

* When amplifying products ≥ 10 kb in length, use primers at a final concentration of 0.1 μM each.

** When amplifying products ≤ 2 kb in length, use 0.5 unit of polymerase.

Recommended Primer design

For ≤ 10 kb products:

For general amplification, select primers with a T_m value of $\geq 55^\circ\text{C}$. 20- to 25-mer primers are suitable, or those greater than 25-mer in length may provide optimal results.

For > 10 kb products:

Select primers with a T_m value of $\geq 65^\circ\text{C}$. 25- to 35-mer primers are suitable. Avoid high GC-content at the 3' end of each primer.

Recommended PCR Program

For GC-rich templates:

98°C	2 min	} 25 ~ 40 cycles
98°C	10 sec	
68°C	10-30 sec/kb	

For ≤ 10 kb products:

98°C	2 min	} 25 ~ 40 cycles
98°C	10 sec	
50~68°C*	15 sec	
68°C	10-30 sec/kb	
68°C	1 min	

For ≥ 10 kb products:

98°C	10 sec	} 25 ~ 40 cycles
68°C	10-30 sec/kb	

* Optimal PCR condition varies according to primers' thermodynamic properties.

Quality Control

Functional Testing

G-HiFi™ DNA Polymerase is tested for performance in the polymerase chain reaction (PCR) using 1 unit of enzyme to amplify a 20 kb target from 1 ng of λDNA. The resulting PCR product is visualized as a single band on an ethidium bromide-stained agarose gel.

Nuclease Assay

No contaminating endonuclease or exonuclease activity was detected using pUC19 incubated with G-HiFi™ DNA Polymerase for 4 hours at 37°C.

Residual Nucleotides Assay

No contaminating residual nucleotides were detected from purified G-HiFi™ DNA Polymerase by PCR assay.

Other Information

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Caution: Not intended for human or animal diagnostic or therapeutic uses.

Related Products

CK1000	Champion E. coli Transformation Kit
CV1000	GetClone PCR Cloning Vector, 20 RXN
CV1100	GetClone PCR Cloning Vector II, 20 RXN
DM2300	ExcelBand 100 bp+3K DNA Ladder, 500 μ l
DM3100	ExcelBand 1 KB (0.25-10 kb) DNA Ladder, 500 μ l
DM4100	ExcelBand XL 25 kb DNA Ladder, Broad Range (up to 25 kb), 500 μ l
DL5000	FluoroDye DNA Fluorescent Loading Dye (Green, 6 \times), 1 ml
DS1000	FluoroStain DNA Fluorescent Staining Dye (Green, 10,000 \times), 500 μ l
NS1000	FluoroVue Nucleic Acid Gel Stain (10,000X), 500 μ l
TF1000	SMO-HiFi DNA Polymerase, 100 U
TF2000	Q-HiFi DNA Polymerase, 100 U
TF3100	G-HiFi 2X PCR Master Mix, 50 RXN
TP1000	ExcelTaq DNA Polymerase, 500 U \times 1
TP1200	ExcelTaq 5 \times PCR Master Dye Mix, 200 RXN
TP2000	ExcelTaq Blood Direct DNA Polymerase, 500 U
TP5000	ExcelTaq Hot Start II DNA Polymerase, 500 U
VE0100	B-BOX™ Blue Light LED epi-illuminator, AC 100-240V, 50/60Hz