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## **Product Information**

**G-HiFi™ series**

### **G-HiFi™ DNA Polymerase**

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#### **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

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## **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 $\mu\text{M}$ *
Reverse primer	0.1 – 0.5 $\mu\text{M}$ *
5X G-HiFi™ Buffer	10 $\mu\text{l}$
dNTPs (2 mM each)	5 $\mu\text{l}$
G-HiFi™ DNA Polymerase	0.5 – 1 unit**
H <sub>2</sub> O	to 50 $\mu\text{l}$
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Total volume	50 $\mu\text{l}$

\* When amplifying products  $\geq 10$  kb in length, use primers at a final concentration of 0.1  $\mu\text{M}$  each.

\*\* When amplifying products  $\leq 2$  kb in length, use 0.5 unit of polymerase.

## Recommended Primer design

*For  $\leq 10$  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  $\leq 10$  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  $\geq 10$  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
CV1100	GetClone PCR Cloning Vector II, 20 RXN
DM2300	ExcelBand 100 bp+3K DNA Ladder, 500 µl
DM3100	ExcelBand 1 KB (0.25-10 kb) DNA Ladder, 500 µl
DM4100	ExcelBand XL 25 kb DNA Ladder, Broad Range (up to 25 kb), 500 µl
DL5000	FluoroDye DNA Fluorescent Loading Dye (Green, 6×), 1 ml
DS1000	FluoroStain DNA Fluorescent Staining Dye (Green, 10,000×), 500 µl
NS1000	FluoroVue Nucleic Acid Gel Stain (10,000X), 500 µl
TF1000	SMO-HiFi DNA Polymerase, 100 U
TP1000	ExcelTaq DNA Polymerase, 500 U × 1
TP1200	ExcelTaq 5× PCR Master Dye Mix, 200 RXN
TP5000	ExcelTaq Hot Start II DNA Polymerase, 500 U
VE0100	B-BOX™ Blue Light LED epi-illuminator, AC 100-240V, 50/60Hz

The latest version of the manual can be downloaded from [www.smobio.com/shop](http://www.smobio.com/shop).