Q5[®] High-Fidelity DNA Polymerase

FIDELITY AT ITS FINEST

Update 2015/16



Fidelity at its finest.

Q5 and Q5 Hot Start High-Fidelity DNA Polymerases

Q5 High-Fidelity DNA Polymerase sets a new standard for both fidelity and performance. With the highest fidelity amplification available (> 100X higher than *Taq* and 2X higher than Thermo Scientific[®] Phusion[®]), Q5 DNA Polymerase results in ultra-low error rates. Q5 DNA Polymerase is composed of a novel polymerase that is fused to the processivity-enhancing Sso7d DNA binding domain, improving speed, fidelity and reliability of performance.

Five quality features of Q5:

- Fidelity the highest fidelity amplification available
 (> 100X higher than *Taq* and 2X higher than Phusion)
- 2. Robustness high specificity and yield with minimal optimization
- 3. Coverage superior performance for a broad range of amplicons (from high AT to high GC)
- 4. Speed short extension times
- 5. Amplicon length robust amplifications up to 20 kb for simple template, and 10 kb for complex



Mandarin Ducks *(Aix galericulata)* are frequently featured in Chinese art and are regarded as a symbol of fidelity.

"Q5 works great. It was able to amplify a very difficult product, one I honestly didn't think would work. I am extremely happy with the Q5 enzyme." scientist – vanderbilt UNIVERSITY

Visit www.Q5PCR.com to request a sample and to view the latest video tutorials on Q5 DNA Polymerase from NEB scientists.

The five quality features of Q5

1. Highest fidelity DNA amplification available

At > 100X higher than *Taq*, Q5 offers unparalleled fidelity for your most important samples, but with a protocol and pricepoint that makes it accessible for routine amplifications.



^c Takagi et al (1997) Appl. Env. Microbiol. 63, 4504-4510.

2. Robust amplification with minimal optimization

High specificity and yield are absolute requirements for today's molecular biology techniques. Q5 delivers both for a wide range of templates.



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3. Superior cover

While other DNA polymera superior performance for a



 $P = Phusion^{\otimes}$ High-Fidelity DNA Polymerase (





Q5 = Q5 Hot Start High-Fidelity DNA Polymer PF = Phusion Hot Start Flex DNA Polymerase

4. Shorter PCR p

Achieve precision without s design incorporating the SS domain enables shorter exter 10 seconds per kb. Addition requires no initial denaturat

"Q5 DNA Polymeras on the first shot."

RESEARCH TECHNOLOGIST — UN

High Fidelity DNA Polymerase

age for a broad range of amplicons, regardless of GC content

ases can have difficulty amplifying high-GC or high-AT amplicons, Q5 DNA Polymerase displays wide range of templates.



orotocols

acrificing speed. Q5's unique o7d processivity-enhancing onsion times, as low as nally, aptamer-based hot start ion step.

e gave me wonderful results

NIVERSITY OF NEBRASKA MEDICAL CENTER

5. Templates up to 20 kb

With Q5, you can reliably amplify simple templates up to 20 kb. Complex templates up to 10 kb can also be amplified with a high degree of confidence.



For more information, visit www.Q5PCR.com

Choose Q5 High-Fidelity DNA Polymerase for ALL your high-fidelity PCR needs.

Comparison of high-fidelity polymerases

PRODUCT NAME (SUPPLIER)	POLYMERASE FIDELITY (Reported by supplier)	MAXIMUM AMPLICON LENGTH ⁶	EXTENSION TIME ⁶ (For simple templates ⁵)	EXTENSION TIME ⁶ (For complex templates ⁵)
Q5 High-Fidelity DNA Polymerase (NEB)	>100X <i>Taq</i> ^{1,2}	20 kb simple; 10 kb complex	10 s/kb	10 s/kb (<1 kb) 20–30 s/kb (>1 kb)
Phusion High-Fidelity DNA Polymerase (NEB)	>50X Taq ^{1,2}	20 kb simple; 10 kb complex	15 s/kb	30 s/kb
Accuprime Pfx (Life)	26X Taq ¹	12 kb ⁴	60 s/kb ⁴	
<i>PfuUltra</i> II Fusion HS (Agilent)	20X <i>Taq</i> ¹	19 kb ⁴	15 s/kb (<10 kb⁴) 30 s/kb (>10 kb⁴)	
<i>PfuUltra</i> High-Fidelity DNA Polymerase (Agilent)	19X <i>Taq</i> ¹	17 kb simple; 6 kb complex	60 s/kb (<10 kb) 120 s/kb (>10 kb)	60 s/kb (<6 kb) 120 s/kb (>6 kb)
Platinum <i>Taq</i> HiFi (Life)	6X Taq ¹	20 kb ⁴	60 s/kb ⁴	
KOD DNA Polymerase (EMD)	4X Taq ³	6 kb simple; 2 kb complex	10–20 s/kb	30–60 s/kb

¹ PCR-based mutation screening in lacZ (NEB), lacl (Agilent) or rpsL (Life)

² Due to the very low frequency of misincorporation events being measured, the error rate of high-fidelity enzymes like Q5 is difficult to measure in a statistically significant manner. Although measurements from assays done side-by-side with Taq yield Q5 fidelity values from 100-200X Taq, we report ">100X Taq" as a conservative value. ³ Takagi et al (1997) Appl. Env. Microbiol. 63, 4504–4510.

4 Template not specified.

⁵ Simple templates include plasmid, viral and E. coli genomic DNA. Complex templates include plant, human and other mammalian canomic DNA.

plant, human and other mammalian genomic DNA.

⁶ Values provided by individual manufacturers.





PCR was performed with a variety of amplicons, with GC content ranging from high AT to high GC, with Q5 and several other commercially available polymerases. All polymerases were cycled according to manufacturers' recommendations, including use of GC Buffers and enhancers when recommended. Yield and purity of reaction products were quantitated and represented, as shown in the figure key, by dot color and size. A large dark green dot represents the most successful performance. Q5 provides superior performance across the range of GC content.

Choose from a Selection of Standalone Enzymes, Master Mixes and Kits

For your high-fidelity PCR needs.

PRODUCT	NEB #	SIZE
Q5 High-Fidelity DNA Polymerase	M0491S/L	100/500 units
Q5 High-Fidelity 2X Master Mix	M0492S/L	100/500 reactions
Q5 Hot Start High-Fidelity DNA Polymerase	M0493S/L	100/500 units
Q5 Hot Start High-Fidelity 2X Master Mix	M0494S/L	100/500 reactions
Q5 Site-Directed Mutagenesis Kit	E0554S	10 reactions
Q5 Site-Directed Mutagenesis Kit (Without Competent Cells)	E0552S	10 reactions
NEBNext® Q5 Hot Start HiFi PCR Master Mix	M0543	50/250 reactions
NEBNext High-Fidelity 2X PCR Master Mix	M0541S/L	50/250 reactions

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Request a free sample of Q5 High-Fidelity DNA Polymerase at www.Q5PCR.com

Featured Online Tools



For help with choosing the best polymerase for your PCR, try our PCR selector at **PCRselector.neb.com**.



For help with calculating annealing temperatures, try our Tm Calculator at TmCalculator.neb.com.

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