Instructions for use

Q-Taq7, 5 U/µl

100 µl (500 units)

Modified recombinant Taq DNA polymerase for high yield PCR amplifications

1. Description

Modified version of the recombinant heat stable Taq DNA polymerase from the thermophilic bacterium *Thermus aquaticus* in storage buffer, plus additional 10x concentrated PCR reaction buffer and 10x concentrated PCR reaction buffer with red gel loading dye.

For research use only. Not approved for use in clinical or *in vitro* diagnostics.

2. Applications

This ***Q-Taq7*** DNA polymerase is the optimal choice for fast Taq-based cycling protocols and for high yield product amounts as being performed, for instance, prior to cloning, for amplicon elution, when using low-copy templates, or for educational purposes, or if particularly short cycle times are required. ***Q-Taq7*** has been engineered for enhanced polymerase activity as well as for particularly speedy elongation, resulting in enhanced yields as well as in time-saving short elongation times. In combination with our unique buffers, the ***Q-Taq7*** DNA polymerase delivers specific PCR amplification with a wide range of PCR templates. Using shorter cycle times, the amplicon amount resulting from this reaction is significantly higher as known from standard Taq polymerases.
Q-Taq7 is able to amplify PCR products up to at least 3 kb with genomic DNA and is appropriate for use in the amplification of DNA from genomic, viral, and plasmid templates. ***Q-Taq7*** DNA polymerase possesses a 5´→ 3´ polymerase- as well as a 5´-flap endonuclease activity and generates a 3'dA (adenine)-overhang which may well be used for TA-cloning purposes.

3. Set contents

Q-Taq7 DNA polymerase in storage buffer containing 50 % glycerol.
PCR buffer (10x) with 20 mM $MgCl_2$.
PCR buffer RED (10x) with 20 mM $MgCl_2$ and 0.1 % cresol red (ready-to-load).
Filled in colour coded tubes.

Reagent	Amount	Lid colour
Q-Taq7 DNA polymerase, 5 U/µl	1 tube, 100 µl	orange
10x PCR buffer	1 tube, 1 ml	blue
10x PCR buffer RED	1 tube, 1 ml	violet

The 10x PCR buffer RED contains a red dye which functions as a loading dye. The buffer has sufficient density for direct loading of PCR reactions onto an agarose gel for PCR product analysis. The red dye migrates in a 1% agarose gel at the same rate as a 1kb DNA fragment. The dye turns yellow at an acidic pH. The use of the colourless PCR reaction buffer is adequate for all general PCR applications and is particularly recommended when direct fluorescence or absorbance readings are required or any further proceedings.

4. Storage Buffer

50 mM Tris-HCl (pH 8.0), 100 mM KCl, 0.1 mM EDTA, 0.5 % IGEPAL CA-630, 0.5 % Tween-20, 1 mM DTT, 50 % glycerol

5. Enzyme activity

5 units/µl enzyme solution

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6. Unit definition

One unit of activity is defined as the amount of enzyme required to incorporate 10 nmoles of dNTP into an acid-insoluble DNA fraction in 30 minutes at 72 °C.

7. Suggested pipetting scheme

At best prepare on ice:

Components	Apply for PCR reaction of 20 µl volume	Final concentration (recommended)
PCR buffer (10x)	2 µl	1x
dNTP-Mix (2 mM)	2 µl	800 µM (200 µM each)
Forward primer (e.g. 5 pmol/µl)	variable (e.g. 1 µl)	0.1-0.5 µM
Reverse primer (e.g. 5 pmol/µl)	variable (e.g. 1 µl)	0.1-0.5 µM
Template DNA	variable	0.01-10 ng / reaction
Q-Taq7 DNA polymerase (5 U/µl)	variable (i.e. 0.2 µl)	0.5-1.5 U
Sterile dest. water	adjust to 20 µl final volume	

8. Basic amplification protocol

Step	Time	Temperature
Initial denaturation	2 minutes	92-95 °C
25-35 cycles		
Denaturation	2-10 seconds	92-95 °C
Annealing	2-10 seconds	55-68 °C
Extension	variable, depends on the length of product	72 °C

9. Notes

For maximum yield and specificity, annealing temperatures and annealing time as well as extension time and cycle numbers should be optimized for each template target and primer pair. Usually the optimal annealing temperature is 2-5 °C below the melting temperature of the primers. Recommended elongation time is 30 seconds per 1 kb of target. In general, elongation times of 30 seconds per 1 kb are sufficient but ***Q-Taq7*** is able to amplify a 1kb fragment in 10 seconds of elongation. Nevertheless, elongation times depend on the complexity of the template DNA.

10. Recommended $MgCl_2$ concentration

2 mM (final)

In case the $MgCl_2$ concentration has to be adjusted, use a separate $MgCl_2$ solution (10 mM) in PCR quality and add in appropriate amounts according to the scheme below. We recommend doing PCR with a $MgCl_2$ gradient in order to find the optimal concentration.

Pipetting scheme for additional $MgCl_2$

Final MgCl2 conc. in mM	2.5	3	3.5	4
Add 10 mM $MgCl_2$ solution in following amounts to 20 µl reaction volume	1 µl	2 µl	3 µl	4 µl

11. Storage conditions

Store the enzyme at -20°C. However, short term storage (few hours) of the enzyme may be done at ± 0°C (wet ice). The enzyme is also stable at room temperature for at least 3 days.
The buffer should be stored at -20°C but may also be stored at +4 °C for several weeks.

Product is not covered by pending or issued patents or may have certain limitations. To our best knowledge, this product does not provide any conflict with pending or issued patents.

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