RADIANT
MOLECULAR TOOLS

Radiant™ Hot-Start Taq DNA Polymerase

Catalog No.	Pack Size and Concentration	Components (Volume)		
C321	250 Reactions	1 x .05mL Hot-Start Taq Polymerase	1 x 2mL 10X Taq Reaction Buffer	2 x 1mL 50mM MgCl2)
C325	1000 Reactions	4 x 0.05mL Hot-Start Taq Polymerase	4 x 2.0 mL 10X Taq Reaction Buffer	4 x 2.0 mL 50mM MgCl2

Description

Radiant™ Hot-Start Taq DNA Polymerase is a highly purified, high performance Hot-Start DNA Polymerase optimized for the sensitive DNA amplification of a wide range of DNA templates including complex mammalian genomic DNA and crude samples. The Hot-Start technology is based on a new-generation PCR buffer formulation in conjunction with a proprietary antibody-mediated chemistry. Radiant™ Hot-Start Taq Polymerase exhibits 5´-3´ DNA polymerase activity with an error-rate of wild-type *Taq* (2.0 x 10^{-5}). The polymerase is ideal for genotyping, colony PCR, multiplexing, low-copy assays, and the amplification of challenging targets susceptible to mispriming. Radiant™ Hot Start Taq DNA Polymerase is engineered for robust, superior PCR and is supplied with a highly optimized, new-generation 5x buffer system which provides exceptional sensitivity and ease of use.

- New-generation 5x PCR buffer formulation including optimal levels of ultra-pure dNTPs, $MgCl_2$ and enhancers for maximum PCR efficiency and reaction speed.
- Robust PCR performance across a wide range of DNA templates including multiplex assays and problematic templates.
- High-yields with amplicons up to 5 Kb with standard or fast cycling.

Storage

Radiant™ Hot-Start Taq Polymerase is shipped on blue or dry ice and should be stored at –20°C upon receipt. Excessive freeze/thawing should be avoided. When stored as specified, Radiant™ Hot-Start Taq DNA Polymerase is stable for 12 months from date of receipt. The Kit may also be stored at 4°C for 1 month.

Important Considerations

Radiant™ 5x HS Taq Reaction Buffer: The 5x HS Taq reaction buffer contains 15mM $MgCl_2$, 5mM dNTPs, proprietary PCR enhancers and has been optimized for maximum efficiency, sensitivity and success with difficult amplicons. **We do not suggest the use of additional PCR enhancers, dNTPs or $MgCl_2$.**

Template: For complex genomic DNA, we suggest the use of 5ng - 500ng per reaction; For cDNA or plasmid DNA, please use < 100ng per reaction.

Primers: Primers should have a predicted melting temperature of around 60°C, using default Primer 3 settings (http://frodo.wi.mit.edu/primer3/). The final primer concentration in the reaction should be between 0.2µM and 0.6µM.

Annealing: We recommend performing a temperature gradient to determine the optimal annealing temperature. Alternatively, we suggest a 55°C annealing temperature. Increase in 2°C increments if non-specific products are present.

Extension: Optimal extension is achieved at 72°C. The optimal extension time is dependent on amplicon length and complexity.

15 seconds per kilobase(Kb) is recommended for amplification from eukaryotic genomic DNA or cDNA for amplicons between 1kb and 6kb. For shorter amplicons, a 1 second extension is sufficient**. For Multiplex PCR, we suggest an initial annealing temperature gradient from 55°C to 65°C in order to determine the highest level of specificity. In addition, we recommend an initial extension time of 90 seconds and greater to maximize yield and specificity.**

Reaction setup

1. Prepare a PCR master mix based on following table:

Component	50µl Reaction	Final Concentration/Notes
Radiant™ 5x HS Taq Reaction Buffer	10 µl	1X
Forward Primer (10µM)	2.0 µl	400 nM
Reverse Primer (10µM)	2.0 µl	400 nM
Template DNA	<100ng cDNA, <500ng genomic	variable
Radiant™ Hot-Start Taq Polymerase (5u/µl)	0.25 µl - 1 µl	variable
PCR-grade water	Up to 50 µl final volume	

* For alternative total reaction volumes (eg. 25 µl), scale all components proportionally and maintain final concentrations.

2. PCR cycling:

Cycles	Temperature & Time		Notes
1	95°C	1 minute to 2 minutes	Initial Denaturation; enzyme activation
40	95°C	15 seconds	Denaturation
	55°C to 65°C	15 seconds	Annealing
	72°C	15 seconds per Kb	Extension (for multiplex PCR, 90 sec.)

Quality Control

Radiant™ Hot-Start Taq Polymerase is tested extensively for robust activity, processivity, efficiency, heat activation, sensitivity, absence of nuclease contamination and absence of nucleic acid contamination. Radiant™ Hot-Start Taq Polymerase is manufactured under a comprehensive quality management system, following ISO 9001:2008 standards.

Limitations of Use

This product is intended for research purposes only and is not intended for any animal or human therapeutic use.

Technical Support

For Trouble-shooting and Technical Guidance, please contact us at tech@alkalisci.com and provide PCR reaction conditions, cycling parameters, amplicon size, and screen grabs (gel images) if possible.

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