

Superior Performance and Flexibility



VELOCITY DNA Polymerase

- Exceptional Speed, reducing reaction times by >50%
- Robust performance with problematic GC and AT rich targets
- Long Range PCR of complex genomic DNA (up to 10kb)
- 50 fold Higher Fidelity than *Taq* Polymerase
- New VELOCITY PCR Kit to improve the efficiency of cloning

Versatile

Bioline has developed VELOCITY DNA Polymerase; an ultra fast thermostable enzyme possessing 3'-5' proofreading exonuclease activity. VELOCITY delivers outstanding PCR yield with exceptional fidelity, even from low template concentrations (Fig. 1). It also has high processivity, resulting in shorter extension times, higher yield and the ability to do long templates in a fraction of the time (Fig. 2). Furthermore, the polymerase offers robust and reliable yields, even in assays in which PCR conditions are compromised with impurities or in complex assays. VELOCITY encompassing the best of all polymerase functionality in one enzyme, making it the only choice for your PCR applications.

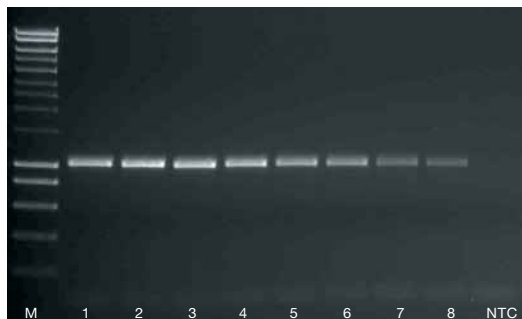


Fig. 1 High yield even from low template concentrations
A 1kb fragment from the *rn18s* mouse genomic DNA gene was amplified from 6.25ng of mouse genomic DNA template using 15s/kb extension step (lane 1), followed by a 2-fold serial dilution series of template (lanes 2-8). PCR was performed in 50 μ l reaction mixtures and 5 μ l was run on a 1% agarose gel. HyperLadder™ I (M). No template control (NTC).

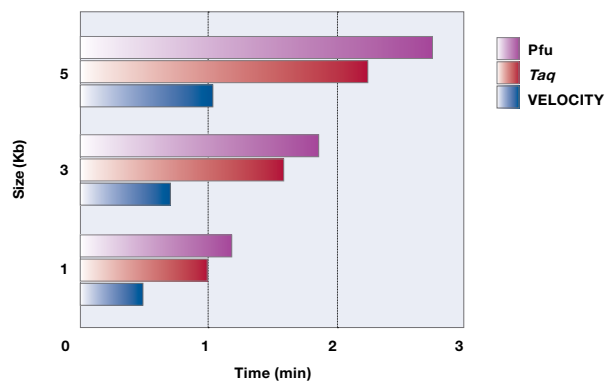


Fig. 2 Estimated PCR extension times for different DNA polymerases
These extension times are based around standard protocols and 25x cycles. Reduced denaturation and extension steps for VELOCITY DNA Polymerase result in shorter PCR runs and improved turnaround times.

VELOCITY DNA Polymerase



GC-rich templates

PCR-amplification of GC-rich templates is often hampered by the formation of secondary structures like hairpins and higher melting temperatures, causing DNA polymerases to stall. This can result in low yields of the target fragment, ladders of non-specific fragments, amplicons of the incorrect length, primer-dimers and/or complete reaction failure. Routine amplification of GC-rich templates with commonly used high-fidelity DNA polymerases therefore, still remains unreliable. The unique properties of VELOCITY, combined with an optimized buffer system, allows superior results, even when using problematic templates (Fig 3).

Long templates

VELOCITY provides both high fidelity coupled with an extremely low error-rate of 4.4×10^{-7} and inherently high processivity. This results in extension rates as fast as 15s/kb for templates of up to 5Kb and 30s/Kb for templates longer than 5kb (Fig. 4). Reduction in PCR turnaround time make VELOCITY the ideal choice for users who wish to generate PCR products with high yield and no mutations.

VELOCITY PCR Kit

To enhance the cloning efficiency of DNA amplified with VELOCITY, Bioline has developed a new VELOCITY PCR Kit. The kit contains VELOCITY DNA polymerase to generate error free PCR products and a PCR Tailing Mix to add a 3'-A overhang, allowing TA cloning.

VELOCITY PCR products are blunt-ended due to the 3'-5' exonuclease activity of the polymerase which removes 3'-A overhangs. A 3'-A overhang is useful, however, as it facilitates more efficient cloning into plasmid vectors. In order to generate a 3'-A overhang, the kit also contains a PCR Tailing Mix, a uniquely blended *Taq* polymerase to add a single Adenine base and an exonuclease inhibitor to reduce the 3'-5' exonuclease activity of the VELOCITY (Fig. 5), thus eliminating the need for purification of the PCR products prior to the addition of the overhang.

The result is 'sticky ended' PCR fragments that can be efficiently ligated straight into a TA cloning vector and transformed directly into competent cells (such as Bioline's α -Select Competent Cells).

VELOCITY PCR Kit includes VELOCITY DNA Polymerase (250 units), a 10x Hi-Fi Buffer (containing 10mM Mg^{2+}), PCR Tailing Mix, 10mM dNTP Mix and DMSO.

The PCR Tailing Mix is also available as a separate product (BIO-21103).

Note: HyperLadder is a trademark of Bioline.

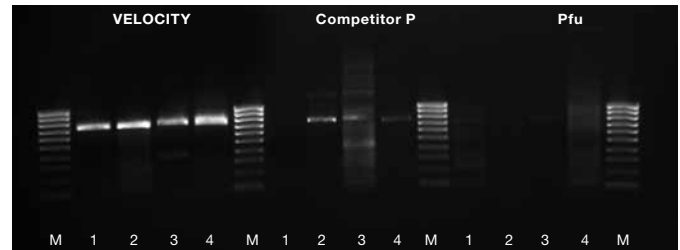


Fig. 3. Amplification of GC-rich DNA fragments from human genomic DNA
VELOCITY, a competitor polymerase (P) and wild-type Pfu were compared. Lanes 1–4 are a 728bp fragment of the GP150 gene (76.9% GC), a 724bp fragment of the MRGRE gene (68% GC), a 723bp fragment of the NM_022372.3 gene (66.9% GC) and a 788bp fragment of the NM_033178.2 gene (70.9% GC) respectively. PCR was performed in 50 μ l reaction mixes and 5 μ l was run on a 1.5% TAE agarose gel. HyperLadder IV (M).

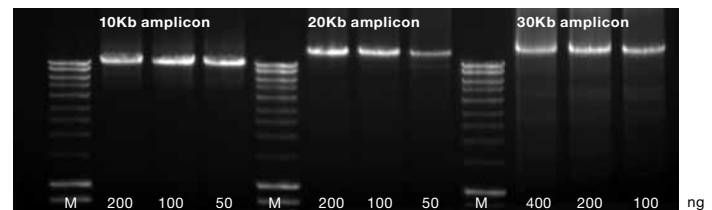


Fig. 4 Fast high yield amplification with VELOCITY DNA Polymerase
Fragments of 10, 20 and 30Kb from Lambda DNA were amplified using 2 Units of VELOCITY DNA Polymerase. The fragments were amplified from 50-400ng of template DNA using a 2-fold serial dilution with 30s/Kb extension time in 50 μ l reaction volumes, containing 2mM $MgCl_2$ with 20 PCR cycles. 5 μ l was run on a TAE agarose gel. HyperLadder I (M). The data illustrates that VELOCITY DNA Polymerase is able to amplify fragments of varying length with a reduced number of cycles, which leads to shorter PCR run times.

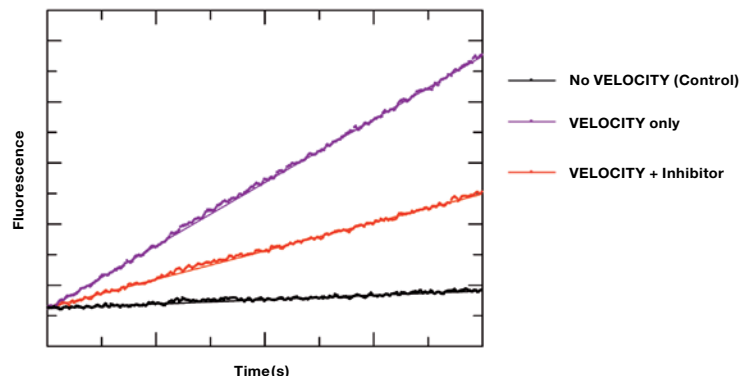


Fig. 5 Inhibition of VELOCITY exonuclease activity by PCR Tailing Mix
VELOCITY was incubated with a FRET-labelled oligonucleotide at 72°C and the enzymes exonucleolytic rate was determined as the change in fluorescence intensity with time. In the presence of the PCR Tailing Mix, the VELOCITY exonuclease activity was reduced significantly.

Ordering Information

PRODUCT	PACK SIZE	CAT NO.
VELOCITY DNA Polymerase	250 Units	BIO-21098
VELOCITY DNA Polymerase	500 Units	BIO-21099
VELOCITY PCR Kit	20 Reactions	BIO-21104
PCR Tailing Mix	50 Reactions	BIO-21103

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