The PCR Company
BIOLINE
since 1992
The PCR Company

PCR Enzyme Guide

A New Generation of End-Point PCR

BIOLINE

A Meridian Life Science® Company

Bioline the PCR Company

For 22 years, Bioline has been developing and manufacturing a complete portfolio of high performance PCR enzymes, for a wide range of applications. During this time, we have analyzed a large number of enzymes, buffer systems and components in order to fully understand the reaction kinetics and processes that lead to high efficiency PCR. Our research in this area has led to the introduction of the proven MyTaq™, MyFi™ and RANGER product ranges, the new generation of Bioline DNA polymerases for reliable and reproducible high-sensitivity, high-efficiency PCR.

Superior handling

Not only have we developed performance leading polymerases, but we have also improved the handling and ease-of-use in PCR experiments. Many of our most popular PCR enzymes are available in practical, ready to use 2x mastermixes. These mixes have been pre-optimized to deliver the best results. Simply add template and primers to achieve high-sensitivity and high-efficiency results for your next publication or report. Many polymerases and mixes have the added advantage of the inclusion of an inert red dye to improve visualization and enable direct gel loading.

Bioline DNA polymerases

Each DNA polymerase has characteristics matched to specific PCR applications. In order to obtain the best results from a particular experiment, it is important to select the polymerase best suited to the application. This guide is intended to assist you in the selection of the most appropriate DNA polymerase for your assay.

Our products speak for themselves

We invite you to visit Bioline Scholar, a compilation of publications citing our reagents and The PCR Challenge, comparative PCR data provided by our customers globally. As our core expertise and focus is the field of PCR, we are proud to be called The PCR Company.

Contents

Choosing the Right DNA Polymerase

Successful PCR depends on two crucial components, an optimized reaction buffer and a high-quality, thermostable DNA polymerase (such as *Taq* DNA polymerase).

Four basic properties of DNA polymerases define the best enzyme for your particular research needs: thermal stability, extension rate, fidelity (the ability to replace incorrectly incorporated nucleotides) and processivity (the probability a polymerase will detach from DNA during extension). Different configurations of these four variables have produced different classes of DNA polymerase, namely:

Standard DNA polymerases
Suitable for routine PCR, such as detection of amplified product and estimation of product size, producing a single-based 'A' overhang, enabling direct insertion into T/A cloning vectors.

Hot-start (HS) polymerases
Used to suppress nonspecific product amplification during setup and to increase yield of the desired product. Hot-start is useful when DNA template amounts are low, DNA templates are highly complex or several pairs of primers are used, as in multiplex PCR.

High-fidelity polymerases
These remove erroneous bases incorporated in the growing DNA strand, increasing the accuracy of DNA synthesis from template DNA. For cloning and expression of amplified product, mutagenesis studies and related applications, proofreading enzymes should be used.

Polymerases for amplification of long amplicons
Amplification of long amplicons combines the processivity of standard DNA polymerases with the accuracy of a proofreading polymerase. This is achieved by blending two polymerases with an optimized buffer, to give amplicons as long as 25kb from genomic DNA.

You should choose your PCR enzyme as follows:

- For general and routine PCR, use a standard DNA polymerase (MyTaq)
- For clean product and high yield, use a hot-start polymerase (MyTaq HS, MyFi)
- For gene expression or mutagenesis experiments, use a proofreading enzyme (ACCUZYME, VELOCITY)
- For long amplicons, use a long-range DNA polymerase (RANGER)

Applications

	MyTaq™ HS	MyTaq™	MyFi™	RANGER	VELOCITY	ACCUZYME™
Standard PCR	✓	✓	✓	○	○	○
Long PCR	-	-	✓	✓		-
Fast PCR	✓	✓	✓		✓	-
Multiplex PCR	✓	○	○	-	-	-
GC-Rich PCR	✓	✓	✓	-		-
Genotyping	✓	✓	✓	-	-	-
Low-Copy PCR	✓		✓	-	✓	✓
Universal Polymerases	✓	-	✓	-	-	-

Properties

Hot-Start	✓	-	✓	○	-	-
High-Fidelity	-	-	✓		✓	✓
High Specificity PCR	✓	-	✓	○	-	-
Pre Mix	✓	✓	✓	✓	-	✓
Direct Loading	✓	✓	-	-	-	-

✓ Best choice ✓ Recommended ○ Suitable

Properties and Applications

HS Hot-Start
Hot-start DNA polymerase is used to suppress non-specific product amplification and primer-dimer formation during set-up, to increase the yield of the desired product. Hot-start PCR is very useful when the amount of DNA template is very low, when the DNA template is highly complex and in multiplex PCR.

HF High-Fidelity
Fidelity refers to the frequency of insertion of an incorrect nucleotide by a polymerase. High-fidelity DNA polymerases minimize the introduction of amplification errors and are used for product that will be cloned, sequenced and expressed. They save time and effort by eliminating the need for down-stream screening in order to obtain error-free constructs.

Sp High Specificity
The specificity of a PCR is how likely it is to produce one and only one amplification product that is the intended target sequence. This is not only related to the hot-start, but also the buffer composition and how well it has been optimized to the DNA polymerase.

S Standard PCR
A standard DNA polymerase is used for general purpose PCR, such as detection of the amplified product and the estimation of product size etc. They produce fragments with 'A' overhang at 3'-end, allowing direct cloned into T/A cloning vectors.

L Long PCR
Long PCR refers to the amplification of DNA lengths that cannot typically be amplified using routine polymerases and reagents.

F Fast PCR
Newer DNA polymerases have extension rates of less than 1kb/30 seconds giving total cycling times of less than 30 minutes. Fast PCR is therefore ideal for high throughput.

M Multiplex PCR
Multiplex PCR consists of multiple primer sets within a single PCR mixture to produce amplicons of varying sizes that are specific to different DNA sequences. Multiplex PCR is ideal for screening assays where the same amplicons are compared in multiple samples.

GC GC-Rich PCR
GC-rich PCR concerns DNA templates with >60% GC content. This high GC content, leads to enhanced thermostability, which is problematic for many *Taq* DNA polymerases that will stall at these sequences.

G Genotyping PCR
Genotyping PCR is the process of determining differences in the genetic make-up of individuals, by amplifying and comparing specific regions of the genomes.

LC Low-Copy PCR
Low-copy templates require highly-sensitive and specific DNA polymerases to reduce the risk of non-specific bands causing smearing or false positive results.

D Direct Gel Loading
An inert red dye is available in a number of our polymerase buffers. Following PCR, samples can be loaded directly onto the agarose gel without the need for a loading buffer, improving ease-of-use.

MyTaq™ HS DNA Polymerase and Mix

Universal polymerase

MyTaq™ HS is a very high-performance, antibody-mediated hot-start DNA polymerase, designed for fast, highly-specific PCR.

RECOMMENDED FOR

HS Sp F G M GC S LC D

FEATURES

- Universal DNA polymerase - recommended for most applications
- Complete PCR reaction in less than 30 minutes
- Antibody-based hot-start polymerase
- Highest specificity and superior performance
- Highly optimized buffer system, including ultra-pure dNTPs and $MgCl_2$
- Available with red dye for direct gel loading
- All-in-one mastermix formulations enhance reproducibility

APPLICATIONS

- Fast PCR reactions
- Colony PCR
- Genotyping
- Multiplexing
- Low-copy PCR assays
- Specific amplification of difficult templates (GC-rich)
- Assays with prolonged reaction set-up

MyTaq HS uses the latest technology in PCR enzyme design, engineered to increase affinity for DNA, resulting in significant improvements in yield, sensitivity and speed. MyTaq HS has the added convenience of room temperature reaction assembly, thus avoiding non-specific amplification and primer-dimer formation. With activation times as low as 1 to 2 minutes, a complete PCR assay can be completed in less than 30 minutes.

The enzyme is supplied with an industry-leading novel buffer system, consisting of a proprietary formulation containing dNTPs, $MgCl_2$ and enhancers at optimal concentrations. This removes the need for optimizing individual reactions and delivers superior amplification time after time making it perfect for applications such as multiplex PCR (Fig. 1).

MyTaq HS Mix is a ready-to-use 2x mix for fast, highly-specific, hot-start PCR. The advanced formulation of MyTaq HS Mix allows fast cycling conditions to be used, greatly reducing the reaction time without compromising PCR specificity and yield (Fig. 2).

MyTaq HS is also available with an inert red dye. Following PCR, samples can be loaded directly onto the agarose gel without the need for an additional loading buffer, as the mix is of sufficiently high density to sink to the bottom of the well.

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
MyTaq HS DNA Polymerase	250 Units	1 x 50µl	BIO-21111
	1000 Units	1 x 200µl	BIO-21112
	2500 Units	2 x 250µl	BIO-21113
MyTaq HS Red DNA Polymerase	250 Units	1 x 50µl	BIO-21114
	1000 Units	1 x 200µl	BIO-21115
	2500 Units	2 x 250µl	BIO-21116
MyTaq HS Mix	200 Reactions	4 x 1.25ml	BIO-25045
	1000 Reactions	20 x 1.25ml	BIO-25046
MyTaq HS Red Mix	200 Reactions	4 x 1.25ml	BIO-25047
	1000 Reactions	20 x 1.25ml	BIO-25048

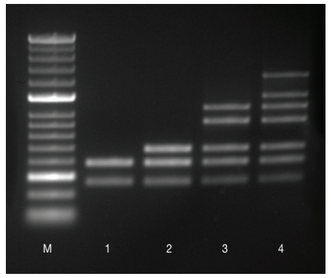

Fig. 1 Multiplex PCR using MyTaq HS Mix
Human genomic DNA was used as a template, with primers to produce amplicons of between 300bp and 1.4kb; lanes 1-4 respectively show 2-, 3-, 5- and 8-plex reaction of these fragments. Marker is HyperLadder 50bp (M). The results illustrate the ability of MyTaq HS Mix to perform uniform multiplex reactions with consistent sensitivity and yields.

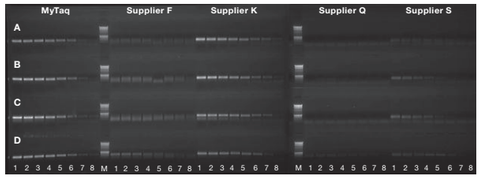

Fig. 2 Fast amplification (26.3 minutes) was carried out on a range of human genomic genes
A 340bp, 450bp, 525bp and 530bp fragment (A-D respectively) was amplified with MyTaq HS and the results were compared with amplifications with hot-start DNA polymerases from other suppliers. The process used a serial dilution of human genomic DNA (lanes 1-8 respectively). MyTaq HS performed well across all four human genes. HyperLadder™ 1kb (M).

MyTaq™ DNA Polymerase and Mix

High throughput and best value

MyTaq™ is a fast, very high-performance DNA polymerase designed to deliver outstanding results on a wide-range of templates.

RECOMMENDED FOR

S G F LC D GC

FEATURES

- New generation polymerase with superior performance
- Novel buffer system, including dNTPs and $MgCl_2$
- Robust and high-yield across a wide range of templates
- Available with red dye for direct gel loading
- Convenient all-in-one mastermix options available

APPLICATIONS

- Genotyping
- High-throughput PCR
- Fast PCR reactions
- GC-rich amplification

MyTaq is based on the latest technology in PCR enzyme preparation. The enzyme is engineered to increase affinity for DNA, resulting in significant improvements to yield, sensitivity and speed over native *Taq* DNA polymerases. The enzyme is supplied with an optimized buffer system, specifically formulated and validated for the unique properties of MyTaq, making it the perfect choice for complex templates (Fig. 1). The buffer contains dNTPs, $MgCl_2$ and enhancers at concentrations formulated to deliver the best results (Fig. 2).

MyTaq Mix is a ready-to-use 2x mix for setting up a trouble-free PCR reaction. The advanced formulation of MyTaq Mix allows fast cycling conditions to be used, with greater efficiency, throughput and reproducibility.

MyTaq is also available with an inert red dye. Following PCR, samples can be loaded directly onto the agarose gel without the need for an additional loading buffer, as the mix is of sufficiently high density to sink to the bottom of the well.

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
MyTaq DNA Polymerase	500 Units	1 x 100µl	BIO-21105
	2500 Units	2 x 250µl	BIO-21106
	5000 Units	4 x 250µl	BIO-21107
MyTaq Red DNA Polymerase	500 Units	1 x 100µl	BIO-21108
	2500 Units	2 x 250µl	BIO-21109
	5000 Units	4 x 250µl	BIO-21110
MyTaq Mix	200 Reactions	4 x 1.25ml	BIO-25041
	1000 Reactions	20 x 1.25ml	BIO-25042
MyTaq Red Mix	200 Reactions	4 x 1.25ml	BIO-25043
	1000 Reactions	20 x 1.25ml	BIO-25044

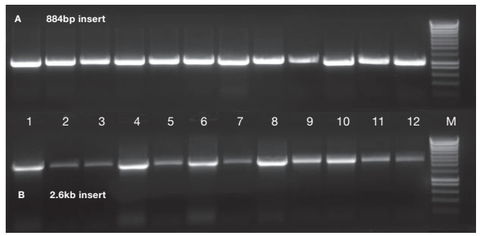

Fig. 1 Robustness of MyTaq in Colony PCR
E.coli transformed with plasmid carrying A) a 884bp or B) a 2.6kb insert were plated out. For each construct 12 colonies were picked with tooth-picks and transferred directly into MyTaq™ PCR reactions. The results illustrates that MyTaq is robust enough to amplify repetitively and successfully the targeted DNA directly from colonies. Hyperladder™ 1kb (M).

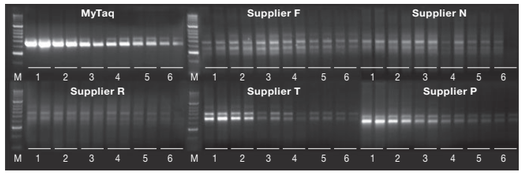

Fig. 2 Robust amplification of GC-rich human genomic DNA (61% GC content)
MyTaq was compared with DNA polymerases from other suppliers for the amplification of a 450bp fragment. Decreasing amounts of human genomic DNA were used as a template (lanes 1-6 respectively) in the PCR. MyTaq delivers higher yield and sensitivity as compared with all five competing products. HyperLadder™ 1kb (M).

MyFi™ DNA Polymerase and Mix

Ideal for difficult amplicons

MyFi™ is a novel, antibody-mediated DNA polymerase complex with enhanced sensitivity and fidelity, ideally suited to problematic DNA templates.

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
MyFi DNA Polymerase	250 Units	1 x 125µl	BIO-21117
	500 Units	1 x 250µl	BIO-21118
	2500 Units	2 x 625µl	BIO-21119
MyFi Mix	100 Reactions	2 x 1.25ml	BIO-25049
	500 Reactions	10 x 1.25ml	BIO-25050

RECOMMENDED FOR

GC HS LC Sp S F G L HF

FEATURES

- New generation DNA polymerase complex provides robust PCR with 3.5-fold higher fidelity than wild-type *Taq* polymerase
- Antibody-based hot-start polymerase enhances specificity and allows room-temperature reaction set-up
- Efficiently amplifies complex mammalian DNA fragments up to 10kb
- Novel 5x buffer system ensures reliability, reproducibility and convenience
- Also available as a ready-to-use, all-in-one 2x mastermix

APPLICATIONS

- TA Cloning
- Long PCR
- Low-copy PCR assays
- PCR of difficult DNA templates (problematic GC/AT-rich genomic DNA)
- High-fidelity PCR assays (library amplification)

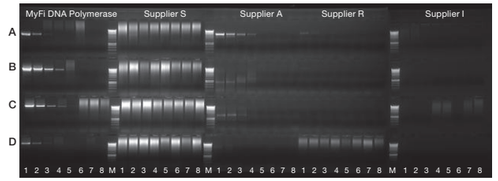

Fig. 1 Amplification of complex DNA up to 10kb
A 3.9kb, 7.0kb, 9.0kb and 10.0kb fragment (A-D respectively) were amplified using MyFi DNA Polymerase and the results were compared with amplifications using high-fidelity hot-start DNA polymerases from other suppliers. The process used a serial dilution of human genomic DNA (lanes 1-8 respectively). The results illustrate that MyFi can be used to amplify products up to 10kb, unlike many of the competing high-fidelity hot-start DNA polymerases tested. HyperLadder™ 1kb (M).

MyFi DNA Polymerase is a high-performance, new generation DNA polymerase complex, combining the sensitivity of our ever-popular MyTaq HS DNA Polymerase with a highly processive proof-reading DNA polymerase. This unique combination coupled with an efficient antibody based hot-start is engineered and optimized for maximum sensitivity and robust, high-fidelity PCR amplification.

MyFi has been developed with an industry-leading, novel buffer chemistry containing pre-optimized concentrations of ultra-pure dNTPs, $MgCl_2$ and proprietary PCR enhancers for exceptional versatility across a range of challenging assays including long PCR, low-copy PCR and amplification of problematic GC and AT-rich genomic templates (Fig. 1). MyFi DNA Polymerase generates extremely high DNA yields and produces 3'-A overhangs which are ideal for direct integration into TA-cloning vectors. In addition, MyFi provides the convenience of room temperature reaction assembly and avoids non-specific amplification and primer-dimer formation.

MyFi Mix is the ready-to-use 2x mix formulation, containing all the components (including proprietary enhancers and stabilizers) necessary for trouble-free PCR reaction assembly, while delivering the same unique balance of PCR sensitivity and high-fidelity. The pre-optimized MyFi Mix formulation, supplied in a convenient single tube, reduces the number of pipetting steps improving throughput and reproducibility (Fig. 2).

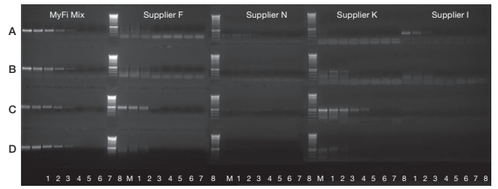

Fig. 2 Efficiency and sensitivity of high-fidelity polymerase mixes
A 525bp, 750bp, 900bp and 1.2kb fragment (A-D respectively), were amplified using MyFi Mix and the results were compared with amplifications using high-fidelity hot-start DNA polymerases from other suppliers. The process used a serial dilution of human genomic DNA (lanes 1-8 respectively). The results illustrate that MyFi Mix out-performed alternative suppliers of high-fidelity mixes on account of higher efficiency and sensitivity over a wide range of sizes. HyperLadder™ 1kb (M).

RANGER DNA Polymerase and Mix

For long amplicons

RANGER DNA Polymerase is highly suitable for all PCR applications of long templates, including sequencing, mapping of chromosomal translocation breakpoints and other structural variations, as well as TA cloning.

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
RANGER DNA Polymerase	250 Units	1 x 62.50µl	BIO-21121
	500 Units	1 x 125µl	BIO-21122
	2500 Units	2 x 312.50µl	BIO-21123
RANGER Mix	100 Reactions	2 x 1.25ml	BIO-25051
	500 Reactions	10 x 1.25ml	BIO-25052

RECOMMENDED FOR

L

FEATURES

- Fast antibody-based hot-start
- Unique buffer system, including ultra-pure dNTPs and $MgCl_2$
- Higher-fidelity than *Taq*
- Available as a convenient all-in-one mastermix for ease of set-up

APPLICATIONS

- Validated for human genomic DNA up to 25kb
- Suitable for TA cloning

RANGER DNA Polymerase is a hot-start enzyme, possessing 5´→3´ DNA polymerase and 3´→5´ proofreading exonuclease activities, thus offering both higher-fidelity and enhanced specificity. The polymerase is supplied with an optimized buffer system, specially formulated and validated for the unique properties of RANGER. The buffer contains dNTPs, $MgCl_2$ and enhancers at concentrations formulated to deliver the best results.

RANGER is an easy-to-use high-performance enzyme designed to amplify templates up to 25kb with extreme sensitivity (Fig. 1). RANGER has the added convenience of room temperature reaction assembly due to its antibody-based hot-start property. This reduces unwanted non-specific amplification such as primer-dimer formation.

RANGER Mix is a ready-to-use 2x mix, based on the RANGER hot-start enzyme. It lacks polymerase activity during the reaction set-up, thus reducing non-specific amplification.

The advanced formulation of RANGER Mix enables proven sensitivity (Fig. 2) and increased fidelity. RANGER Mix contains all the reagents necessary for trouble-free PCR reaction set-up. For your convenience, all of the components are supplied in one tube, to reduce the number of pipetting steps and to improve efficiency and reproducibility.

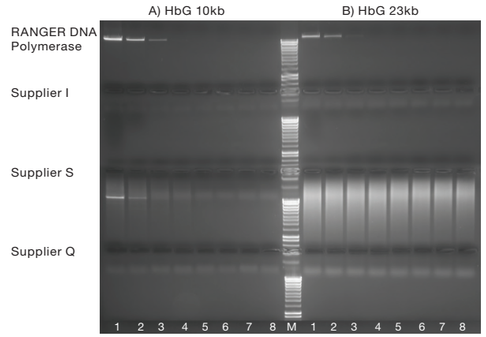

Fig. 1 Amplification of complex DNA greater than 10kb
A) A 10kb fragment and B) a 23kb fragment were amplified using RANGER Polymerase and the results were compared with amplifications using high-fidelity hot-start DNA polymerases from other suppliers. The process used a serial dilution of human genomic DNA (lanes 1-8 respectively). The results illustrate that RANGER can be used to amplify products up to 23kb from human genomic DNA, unlike many other competing long-fragment DNA polymerases tested. HyperLadder™ 1kb (M).

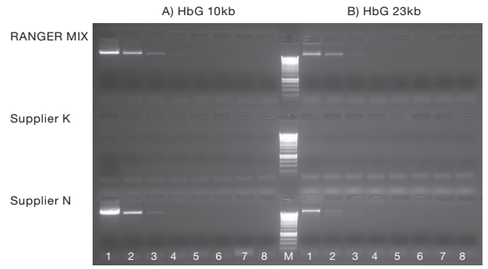

Fig. 2 Efficiency and sensitivity of high-fidelity polymerase mixes
A) A 10kb fragment and B) a 23kb fragment were amplified using RANGER Mix and the results were compared with amplifications using high-fidelity hot-start DNA mixes from supplier K and supplier N. The process used a serial dilution of human genomic DNA (lanes 1-8 respectively). The results illustrate that RANGER Mix is more sensitive than other suppliers mixes, particularly with larger fragments. HyperLadder™ 1kb (M).

Polymerases

VELOCITY DNA Polymerase

Perfect for high-fidelity PCR

VELOCITY DNA Polymerase is an ultra-fast thermostable enzyme possessing 3'→5' proofreading exonuclease activity, which makes it ideal for high-fidelity PCR.

RECOMMENDED FOR

HF | F | LC

FEATURES

- High-fidelity DNA polymerase
- High-processivity
- Fast amplification
- Ideal for a wide range of templates including long templates greater than 5kb

APPLICATIONS

- Cloning techniques where high fidelity is desirable
- GC-rich templates
- Blunt-end cloning
- Site directed mutagenesis

VELOCITY delivers outstanding PCR yield with exceptional fidelity error rates of less than 4.4 x 10^{-7} bases, even from low template concentrations. High-processivity and extension rates result in shorter extension times in assays including those that are complex or contain impurities (Fig. 1).

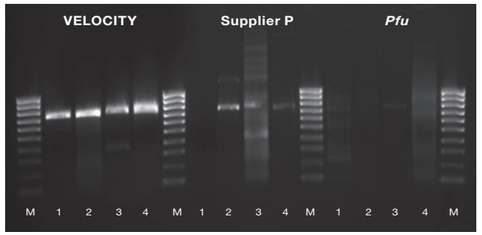

Fig. 1 Amplification of GC-rich DNA fragments from human genomic DNA
VELOCITY, a competitor polymerase (P) and wild-type *Pfu* were compared. Lanes 1–4 are a 728bp fragment (76.9% GC), a 724bp fragment gene (68% GC), a 723bp fragment (66.9% GC) and a 788bp fragment (70.9% GC) respectively. PCR was performed in 50µl reaction mixes and 5µl was run on a 1.5% TAE agarose gel. The results illustrate that VELOCITY is reliable even with GC-rich templates. HyperLadder™ 100bp (M).

ACCUZYME™ DNA Polymerase and Mix

Right on target

ACCUZYME™ is a thermostable enzyme possessing 5'→3' DNA polymerase and 3'→5' proofreading exonuclease activities, offering high-fidelity.

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
ACCUZYME DNA Polymerase	250 Units	1 x 100µl	BIO-21051
	500 Units	1 x 200µl	BIO-21052
ACCUZYME Mix	500 Reactions	10 x 1.25ml	BIO-25028

RECOMMENDED FOR

HF | LC

FEATURES

- High-fidelity
- Amplifies fragments up to 5kb
- Available as a convenient pre-mix (ACCUZYME Mix)

APPLICATIONS

- High-fidelity PCR ideal for subsequent cloning
- Blunt-end cloning
- Site directed mutagenesis

ACCUZYME is a high-fidelity (proofreading) polymerase that produces blunt-ended amplicons up to 5kb. ACCUZYME possesses very high PCR sensitivity and is ideally suited to low-copy target amplifications (Fig. 1). ACCUZYME Mix dramatically reduces the time needed to set up reactions, thereby minimizing the risk of contamination.

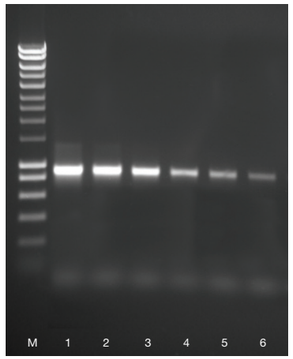

Fig. 1 High performance with ACCUZYME at low template concentrations
An 800bp fragment was amplified from 500ng, 50ng, 5ng, 0.5ng, 50pg and 5pg (lanes 1-6 respectively) of human genomic DNA with ACCUZYME Mix. The results illustrate that ACCUZYME is highly sensitive even with low template concentrations. HyperLadder™ 1kb (M).

MyTaq™ Extract-PCR Kit

PCR direct from tissues

The MyTaq™ Extract-PCR Kit offers a quick and easy alternative for the extraction and amplification of DNA from a variety of tissue types.

PRODUCT	PACK SIZE	CAT NO.
MyTaq Extract-PCR Kit	100 Reactions	BIO-21126
	500 Reactions	BIO-21127

RECOMMENDED FOR

G | F | M | HS | D

FEATURES

- Rapid extraction protocol: High yield PCR-ready DNA in about 15 minutes
- Replaces complicated DNA extraction procedures
- Perfect for high-throughput genotyping from mammalian tissues
- Convenient single-tube reaction minimizes contamination
- MyTaq HS Red Mix for fast and highly-specific amplification and direct gel loading

APPLICATIONS

- Ideal for high-throughput genotyping from mammalian tissues
- Detection of transgenes
- Knockout analysis

Many DNA extraction methods can be laborious and time consuming, involving the use of hazardous chemicals. MyTaq Extract-PCR Kit offers a rapid easy and safe alternative for the extraction and amplification of DNA from a variety of tissue types. MyTaq Extract-PCR Kit is particularly suited to solid tissues such as mouse tail and ear.

The extracted DNA is amplified in a proprietary buffer system using MyTaq HS Red Mix, to give high sensitivity and very high yields, as well as allowing fast cycling times for direct gel-loading for high throughput assays.

When used with the same starting material, MyTaq Extract-PCR Kit gives a better yield and is more sensitive, compared to other suppliers of similar kits. The kit offers a convenient alternative for the extraction of DNA for applications such as mouse genotyping and sequencing (Fig. 1).

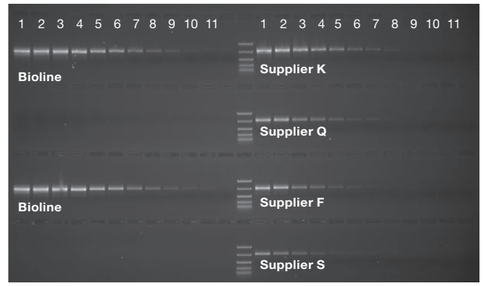

Fig 1. MyTaq Extract-PCR was used to extract and amplify genomic DNA from 3mg pieces of mouse tail.
Genomic DNA was extracted in a 100µl reaction and 1µl of the supernatant used for the PCR reactions. After an initial 1 in 30 dilution, serial two fold dilutions of the supernatant were used with MyTaq HS Mix for amplification of a 1kb fragment from mouse γ-actin (Lanes 1–11). EasyLadder I (M).

MyTaq™ Blood-PCR Kit

PCR direct from whole blood

MyTaq™ Blood-PCR Kit offers fast, highly-specific, direct PCR from whole blood samples.

PRODUCT	PACK SIZE	CAT NO.
MyTaq Blood-PCR Kit	100 Reactions	BIO-25053
	250 Reactions	BIO-25054

RECOMMENDED FOR

HS F M G

FEATURES

- Extraction-free, eliminates complex DNA extraction protocols
- Novel buffer system designed to overcome blood inhibition
- MyTaq™ HS Mix for fast and highly-specific amplification
- Ideal for multiplexing, GC-rich templates and longer amplicons

APPLICATIONS

- SNP genotyping
- Human and animal blood extraction and amplification
- Blood preserved with heparin, citrate or EDTA

MyTaq Blood-PCR Kit is highly optimized for use with whole blood collected with various anticoagulants (EDTA, citrate, heparin) from both human and non-human origins.

MyTaq Blood-PCR Kit has been specifically developed to overcome PCR inhibitors typically present in blood samples to give significantly increased sensitivity and PCR success rates (Fig. 1).

The advanced formulation of MyTaq Blood-PCR Kit allows the use of fast cycling conditions without compromising PCR specificity and yield. The speed and high specificity of MyTaq Blood-PCR Kit also makes it highly suitable for multiplex PCR applications.

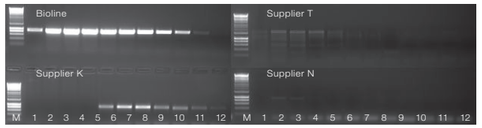

Fig. 1 MyTaq Blood-PCR Kit amplification from whole blood
An 844bp fragment was amplified from whole human blood preserved with the anticoagulant lithium heparin. Two-fold serial dilutions from 20% human whole blood were used in reactions using MyTaq Blood-PCR Kit and Kits from suppliers K, T and N (lanes 1-12). The results illustrate the significantly improved yield at both higher and lower whole blood concentrations, with MyTaq Blood-PCR Kit outperforming other kits. HyperLadder™ 1kb (M).

MyTaq™ One-Step RT-PCR Kit

Successful RT-PCR from RNA

The MyTaq™ One-Step RT-PCR Kit has been formulated for highly reproducible first-strand cDNA synthesis and subsequent PCR in a single tube.

PRODUCT	PACK SIZE	CAT NO.
MyTaq One-Step RT-PCR Kit	25 Reactions	BIO-65048
	100 Reactions	BIO-65049

RECOMMENDED FOR

HS F LC GC

FEATURES

- Extremely sensitive blend of RT and novel hot-start MyTaq
- Highly optimized for detection of low-copy genes
- Overcomes secondary structure in difficult and GC-rich targets
- High-quality, full-length cDNA from as little as 3pg total RNA
- Available as a simple to use all-in-one mix

APPLICATIONS

- Gene-expression analysis
- Transcription analysis
- Gene cloning
- Multiplex RT-PCR

MyTaq One-Step RT-PCR Kit uses the latest advances in buffer chemistry combined with a novel reverse transcriptase and hot-start DNA polymerase. This ensures that MyTaq One-Step RT-PCR Kit produces fast, highly-specific and ultra-sensitive one-step RT-PCR (Fig. 1), perfect for all downstream applications.

MyTaq One-Step RT-PCR Kit consists of reverse transcriptase, 2x MyTaq HS Mix and a potent RNase Inhibitor, RiboSafe, that collectively create a simple to use all-in-one mix.

The kit is ideal for determining the presence or absence of RNA templates and quantifying expression through qualitative, semi-quantitative or quantitative analysis of RNA transcription levels. The one-step format is also perfect for the synthesis of double-stranded cDNA products for subsequent gene-expression analysis.

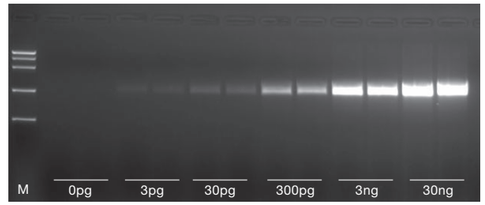

Fig. 1 Sensitivity of MyTaq One-Step RT-PCR Kit
A serial dilution of mouse total RNA in duplicate was used in a reverse transcription reaction and amplified to produce a 1kb fragment. The results illustrate that the MyTaq One-Step RT-PCR Kit is sensitive enough to reverse transcribe and amplify as little as 3pg total RNA. HyperLadder™ 50bp (M).

EPIK™ Amplification Kit

Bringing reliability to epigenetics

EPIK™ Amplification Kit is a ready-to-use, PCR mix engineered to overcome the challenges associated with bisulfite-modified DNA.

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
EPIK™ Amplification Kit	200 Reactions	4 x 1.25ml	BIO-66025
	500 Reactions	10 x 1.25ml	BIO-66026

RECOMMENDED FOR

HS F GC G LC

FEATURES

- Outstanding reliability, engineered for best-in-class epigenetic analysis time after time
- Dedicated EPIKORE™ buffer system, optimized for amplification of bisulfite-modified DNA
- Engineered to amplify fragments with low, medium and high GC content without bias
- Hot-start system powered by MyTaq™ HS for high specificity
- Enhanced polymerization for longer amplicons
- Higher yield even with low DNA template

APPLICATIONS

- Bisulfite-modified, uracil containing DNA (up to 1.5kb)
- Difficult DNA templates e.g. GC-rich
- Bisulfite-restriction PCR e.g. COBRA
- Bisulfite-sequencing PCR (Sanger, oxBS-seq, TAB-seq, NOME-seq)
- Bisulfite NGS library preparation (Whole Genome, RRBS)
- Pyrosequencing assays
- TA cloning

EPIK Amplification Kit has been specifically engineered for amplification of bisulfite-modified DNA and features a dedicated buffer system (EPIKORE™), designed to overcome the problems associated with bisulfite-modified, uracil-containing DNA templates such as template degradation and uracil stalling. EPIK Amplification Kit offers significant improvements in reliability, yield, sensitivity leading to far greater PCR success rates.

EPIK delivers truly unrivaled, market-leading performance, even with longer amplicons (1.5kb) (Fig. 1). Furthermore, EPIK offers significantly improved amplification success rates with low template concentrations (<0.5ng) of bisulfite-modified DNA (Fig. 2).

Powered by MyTaq™ HS and EPIKORE™ technology, the high speed and enhanced specificity of EPIK™ Amplification Kit makes it highly suited for high-throughput epigenetic assays and the very latest bisulfite sequencing applications.

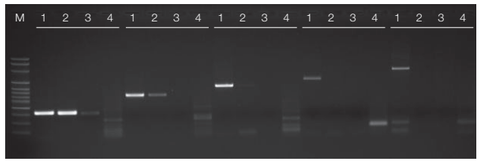

Fig. 1 EPIK Amplification Kit offers unrivalled performance from bisulfite-modified DNA templates
Primers were designed for bisulfite-modified sequences (323bp, 600bp, 810bp, 1kb and 1.5kb). PCR was performed with 1) EPIK Amplification Kit and kits from suppliers 2) B, 3) Q and 4) I according to the manufacturers' recommended conditions. The results illustrate that only EPIK was able to amplify all five fragments successfully and so offers significantly improved performance with bisulfite-modified DNA. HyperLadder™ 100bp Plus (M)

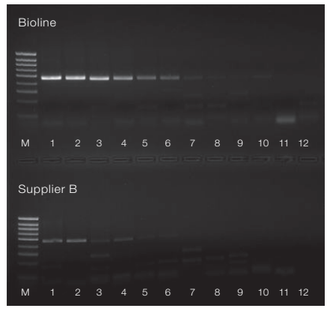

Fig. 2 EPIK Amplification Kit delivers extremely sensitive and highly specific amplification even from low amounts of DNA template
A two-fold serial dilution from 35ng bisulfite-modified DNA (lanes 1-12) was used to amplify a 474bp fragment with EPIK Amplification Kit and enzyme from supplier B, using the recommended conditions. The results illustrate the unrivalled sensitivity of EPIK compared to supplier B, even with low template concentrations. HyperLadder™ 100bp (M).

Ordering Information

PRODUCT	PACK SIZE	PRESENTATION	CAT NO.
Hot-Start DNA Polymerases			
MyTaq HS DNA Polymerase	250 Units	1 x 50µl	BIO-21111
	1000 Units	1 x 200µl	BIO-21112
	2500 Units	2 x 250µl	BIO-21113
MyTaq HS Red DNA Polymerase	250 Units	1 x 50µl	BIO-21114
	1000 Units	1 x 200µl	BIO-21115
	2500 Units	2 x 250µl	BIO-21116
MyTaq HS Mix	200 Reactions	4 x 1.25ml	BIO-25045
	1000 Reactions	20 x 1.25ml	BIO-25046
MyTaq HS Red Mix	200 Reactions	4 x 1.25ml	BIO-25047
	1000 Reactions	20 x 1.25ml	BIO-25048
MyFi DNA Polymerase	250 Units	1 x 125µl	BIO-21117
	500 Units	1 x 250µl	BIO-21118
	2500 Units	2 x 625µl	BIO-21119
MyFi Mix	100 Reactions	2 x 1.25ml	BIO-25049
	500 Reactions	10 x 1.25ml	BIO-25050
High-Fidelity DNA Polymerases			
VELOCITY DNA Polymerase	250 Units	1 x 125µl	BIO-21098
	500 Units	1 x 250µl	BIO-21099
ACCUZYME DNA Polymerase	250 Units	1 x 100µl	BIO-21051
	500 Units	1 x 200µl	BIO-21052
ACCUZYME Mix	500 Reactions	10 x 1.25ml	BIO-25028
DNA Polymerases for Longer Amplicons			
RANGER DNA Polymerase	250 Units	1 x 62.50µl	BIO-21121
	500 Units	1 x 125µl	BIO-21122
	2500 Units	2 x 312.50µl	BIO-21123
RANGER Mix	100 Reactions	2 x 1.25ml	BIO-25051
	500 Reactions	10 x 1.25ml	BIO-25052
DNA Polymerases for Routine Applications			
MyTaq DNA Polymerase	500 Units	1 x 100µl	BIO-21105
	2500 Units	2 x 250µl	BIO-21106
	5000 Units	4 x 250µl	BIO-21107
MyTaq Red DNA Polymerase	500 Units	1 x 100µl	BIO-21108
	2500 Units	2 x 250µl	BIO-21109
	5000 Units	4 x 250µl	BIO-21110
MyTaq Mix	200 Reactions	4 x 1.25ml	BIO-25041
	1000 Reactions	20 x 1.25ml	BIO-25042
MyTaq Red Mix	200 Reactions	4 x 1.25ml	BIO-25043
	1000 Reactions	20 x 1.25ml	BIO-25044
Complete Kits for Specialized Applications			
MyTaq Extract-PCR Kit	100 Reactions	Kit	BIO-21126
	500 Reactions	Kit	BIO-21127
MyTaq Blood-PCR Kit	100 Reactions	Kit	BIO-25053
	250 Reactions	Kit	BIO-25054
MyTaq One-Step RT-PCR Kit	25 Reactions	Kit	BIO-65048
	100 Reactions	Kit	BIO-65049
EPIK Amplification Kit	200 Reactions	4 x 1.25ml	BIO-66025
	500 Reactions	10 x 1.25ml	BIO-66026

Technical Support

For technical assistance or more information on these products, please contact us at tech@bioline.com or call us on

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