Next Generation PCR Enzymes

- **Bestaq™ DNA Polymerase**
- **2X PCR Bestaq™ MasterMix**
- **Taq DNA Polymerase**
- **2X PCR Taq MasterMix**
- **Precision™ DNA Polymerase**
- **2X PCR Precision™ MasterMix**
- **Taq Plus DNA Polymerase**
- **2X PCR Taq Plus MasterMix**
- **TaqFast DNA Polymerase**
- **2X PCR TaqFast MasterMix**
- **Bloodirect DNA Polymerase**
- **HotStart DNA Polymerase**
- **Long-Range DNA Polymerase**

Advantages of using Next Generation Enzymes

- Exceptionally high fidelity – Over 50-fold improvement compared to Taq DNA Polymerase
- Extremely efficient – Significantly shorter extension times, considerable time savings
- Robust performance – Amplification of long templates (up to 20 kb from genomic templates)
- High yield and sensitivity – Superior yield even with minimal template DNA
- All purpose polymerases - From routine PCR to difficult cloning
- Cost savings – Minimal enzyme amounts required
- Various kit formats for convenience with consistent results

Redefining the Standards with Next Generation PCR Enzymes

Bestaq™ DNA Polymerase

abm's Bestaq™ DNA Polymerase is a unique, single-polymerase based system that has established a new standard for routine and demanding PCR applications. Bestaq™'s industry leading performance is attributed to our proprietary engineering that conveys intrinsically enhanced processivity which increases yield, speed, and amplification length during PCR. This innovative enzyme is the ideal choice for a variety of PCR applications, especially those that involve difficult templates or long range amplifications, allowing for reduced extension steps and reaction times. With one of the highest fidelities available on the market (over 50-fold better than Taq DNA Polymerase) **abm**'s Bestaq™ consolidates all PCR applications into one efficient system. Bestaq™ is available as an independent enzyme with its optimized buffer or in a convenient, ready-to-use MasterMix solution.

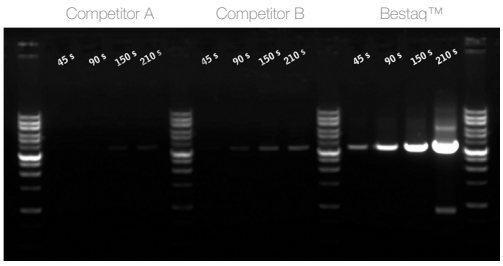

Figure 1: Bestaq™ Combines High Speed with Efficiency
A 3.5 kb target gene was amplified using Bestaq™ and two competitor polymerases. Bestaq™ was able to amplify the target with superior yields in a shorter time compared to competitor enzymes.

Extreme Processivity leads to Faster PCR

The high processivity of Bestaq™ is attributed to strategic mutations that increase its affinity for DNA which leads to faster incorporation of nucleotides during a single binding event and increased sensitivity. This increase in efficiency translates to significantly reduced extension time. The robustness of Bestaq™ allows less enzyme to be used to amplify gene targets, even long templates (>15 kb), with considerable time savings.

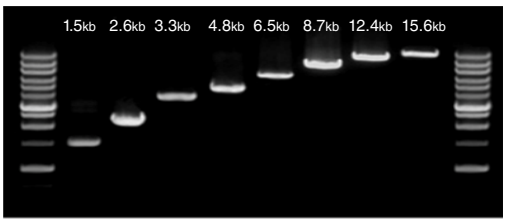

Figure 2: Bestaq™ Specifically Amplifies Genomic Template DNA up to 15.6 kb
PCR amplification with Bestaq™ of various targets, ranging from 1.5 kb to 15.6 kb, from genomic DNA, followed by electrophoresis on a 1% agarose gel.

Precision™ High Fidelity DNA Polymerase

abm's Precision™ High Fidelity DNA Polymerase has a 60-fold higher accuracy than Taq DNA Polymerase creating a new standard for high fidelity PCR applications. The exceptional proofreading and processivity of Precision™, as well as its optimized reaction buffer system and protocol, are responsible for its superior performance. Highly accurate PCR is critical for downstream applications such as cloning, whole-genome and standard sequencing, site-directed mutagenesis, and protein expression. Precision™ is the perfect choice for high fidelity PCR and is available as an independent enzyme with its optimized buffer or in a convenient, ready-to-use MasterMix solution.

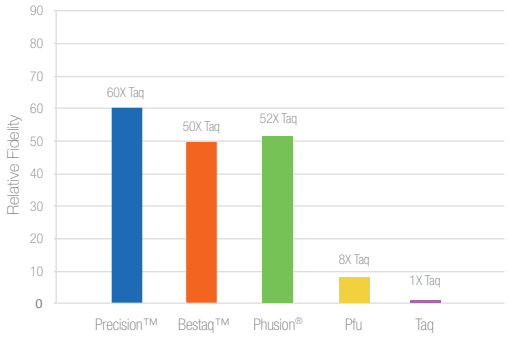

Figure 3: Precision™ has Exceptionally High Fidelity
Precision™ DNA Polymerase has the highest accuracy rate compared to other DNA polymerases. Shown as relative fidelity compared to Taq DNA Polymerase (Taq = 1X).

HotStart Taq DNA Polymerase

HotStart Taq DNA Polymerase is a modified form of Taq DNA Polymerase that requires thermal activation (at 94°C for 3 - 5 minutes) to attain full functionality.

- Increased sensitivity, specificity, and yield
- Eliminates non-specific priming events
- Prevents primer degradation during PCR setup

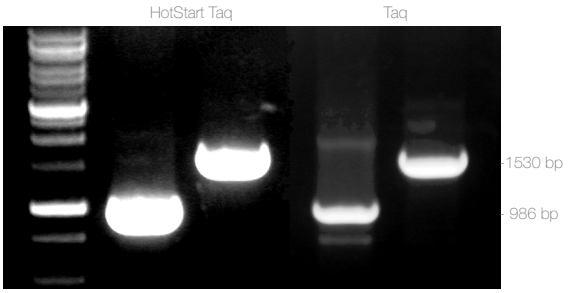

Figure 4: Specificity of HotStart Taq
HotStart Taq and Taq were used to PCR two targets, 986 bp and 1530 bp long, from human genomic DNA, followed by electrophoresis on a 1% agarose gel. HotStart Taq amplified both fragments with high yield and specificity.

TaqFast DNA Polymerase

TaqFast DNA Polymerase is an optimized mutational derivative of Taq DNA Polymerase developed to achieve high-speed PCR.

- Short extension times of 10 - 15 seconds/kb
- Reduced total reaction time
- Detects very low amounts of template
- Also available in MasterMix format (with or without dye)

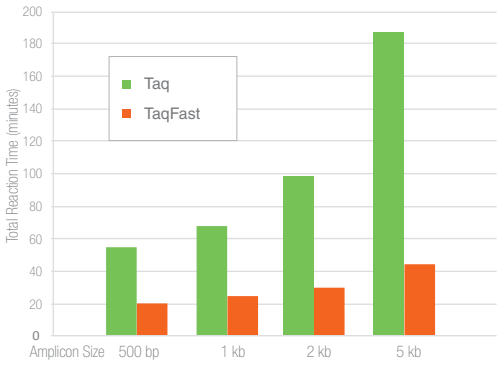

Figure 5: TaqFast Significantly Reduces PCR Elongation Times
Total reaction times of TaqFast and Taq were determined for the generation of different sized amplicons; 500 bp, 1 kb, 2 kb and 5 kb. Reaction times are based on a 30-cycle program using the recommended reaction protocol for each enzyme.

Long-Range DNA Polymerase

Long-Range DNA Polymerase is a polymerase blend system allows for the amplification of templates up to 20 kb. Attempts to PCR amplify long templates often fail and generally require extensive optimization of procedures. Long-Range DNA Polymerase circumvents this problem by combining two thermostable polymerases with **abm**'s proprietary buffer which allows for an optimal reaction environment tailored for long PCR applications.

- High yields of very long amplicons
- Improved fidelity over Taq DNA Polymerase
- Full amplification of long templates – No truncated products

Taq Plus DNA Polymerase

Taq Plus DNA Polymerase is a two-polymerase blend system that is characterized by highly sensitive detection of templates paired with significantly improved fidelity compared to Taq DNA Polymerase.

- 5-fold higher fidelity than Taq DNA Polymerase
- Useful in any PCR application that requires accuracy without compromising consistent detection of templates with a high yield
- Also available in MasterMix format (with or without dye)

Bloodirect DNA Polymerase

Bloodirect DNA Polymerase is an optimized mutational derivative of Taq DNA Polymerase developed to allow for direct PCR amplification from blood.

- PCR amplification from blood that is:
  - fresh or frozen
  - preserved with EDTA, citrate or heparin
  - dried onto commercial cards or filter paper
- Reduces the risk of contamination
- Saves sample preparation time and cuts costs in genetic testing of humans and animals
- Also available in MasterMix format

Enzyme Characteristics and Formats

Characteristic	Bestaq™	Precision™	Taq	HotStart Taq	Taq Plus	TaqFast	Long-Range	Bloodirect
Proofreading	Yes	Yes	No	No	Yes	Yes	No	No
Fidelity (vs Native taq)	50X	60X	1X	1X	5X	10X	1X	1X
Specificity	●●●	●●●	●●	●●●●	●●	●●●	●●●	●●
Extension Speed (per minute)	3-4 kb	1 kb	1 kb	1 kb	1 kb	4-6 kb	3-4 kb	1 kb
Target Length	15 kb	6 kb	6 kb	6 kb	6 kb	12 kb	20 kb	2 kb
MasterMix available	Yes	Yes	Yes	No	Yes	Yes	No	Yes
Special Feature	All PCR Applications	High Fidelity PCR	Routine PCR	High Specificity	Improved Fidelity	Fast PCR	Long Amplicons	Extraction Free

Technical Support

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