B

DNA/RNA Amplification

DNA Amplification
RNA Amplification
Real-Time qPCR and RT-qPCR
Customized PCR, RT & RT-PCR PreMix

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Bioneer Corporation

01 DNA Amplification

DNA Amplification

DNA Amplification

AccuPower® PCR PreMix 73

AccuPower® *Taq* PCR PreMix 77

AccuPower® PCR PreMix (with UDG) 79

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AccuPower® *ProFi Taq* PCR PreMix 92

AccuPower® Multiplex PCR PreMix 95

AccuPower® Gold Multiplex PCR PreMix 98

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Overview

AccuPower® PreMix series is an innovative PCR Master Mix products designed to make your experiments easier and more cost effective than ever. With a wide range of applications and unparalleled ease of use and stability, *AccuPower*® PCR PreMix series will be an important addition to your collection of research tools.

Each tube or plate you order has all the components of a PCR Master Mix (enzyme, buffer and dNTPs) lyophilized with a patented stabilizer that maintains full activity for over one month at room temperature, one year at 4℃ and two years in the freezer. Simply add your primers and template. You do not need to make a dNTP stock solution or aliquot PCR enzymes again. In addition, since there are no stock solutions, you will never have to deal with or worry about contaminated stock solutions. Each reaction is pre-dispensed and dried in its own tube/well!

To extend *AccuPower*® shelf life, our unique stabilizers also improve enzyme Shalf-life. In fact, enzyme's stability is maintained at 95℃ for up to 3 times as long as standard, based on liquid, DNA polymerases, that makes it to be an ideal enzyme for amplification of G:C rich DNA.

AccuPower® PreMix PCR Master Mix is availableing, in regard less of being with or without loading dye. When loading dye is present you can load it directly into your gel after PCR – no such a glycerol or sucrose is required.

Selection Guide

Choose the Bioneer PreMix

■ DNA Amplification

		Amplification	PCR PreMix *Top* Pol.	*Taq* PCR PreMix *Taq* Pol.	HotStart PCR PreMix *Top* Pol.	*Pyro HotStart Taq* PCR PreMix	*Pfu* PCR PreMix	Multiplex PCR PreMix *Top* Pol.	Gold Multiplex PCR PreMix *Top* Pol.
DNA	PCR	Standard PCR	√	√	√	√		√	√
		HotStart PCR			√	√		√	√
		High-fidelity PCR					√		
		Long-range PCR					√		
		GC rich PCR			√	√			
		Real-Time PCR		√		√			
		Multiplex PCR			√	√		√	√

■ RNA Amplification

	Amplification	RT PreMix	*CycleScript* RT PreMix	*RocketScript* RT PreMix	*RocketScript* Cycle RT PreMix	RT-PCR PreMix	*RocketScript* RT-PCR PreMix	RocketPlex RT-PCR PreMix
PCR	Standard PCR					√	√	√
RT	Standard RT	√	√	√	√	√	√	√
	CTRT		√		√		√	√
RT/PCR	Standard RT/PCR					√	√	√
	Multiplex RT/PCR							√

■ Real-Time PCR

	Amplification	*GreenStar* qPCR PreMix (SYBR)	2X *GreenStar* qPCR Master Mix (SYBR)	*DualStar* qPCR PreMix (Probe)
PCR	HotStart PCR	√	√	√
	Real-Time PCR	√	√	√

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Specifications of *AccuPower*® PreMix series

Product	Product Size	Yield	Specificity	Fidelity	Convenience	GC-rich	Heat Stability
PCR PreMix	≤ 10 kb	*****	***	***	*****	***	***
Taq PCR PreMix	≤ 10 kb	*****	***	***	*****	***	***
HotStart PCR PreMix	≤ 12 kb	****	****	***	*****	****	****
PyroHotstart Taq PCR PreMix	≤ 5 kb	****	****	***	*****	****	****
Pfu PCR PreMix	≤ 20 kb	***	***	****	*****	***	***
ProFi Taq PCR PreMix	≤ 30 kb	***	****	*****	*****	***	****
Multiplex PCR PreMix	1~20 frag.	****	****	***	*****	***	****
Gold Multiplex PCR PreMix	1~20 frag.	****	****	***	*****	***	****
RT PreMix	< 9 kb	***	-	-	*****	***	***
CycleScript™ RT PreMix	< 9 kb	****	-	-	*****	***	***
RocketScript™ RT PreMix	< 10 kb	****	-	-	*****	****	****
RocketScript™ Cycle RT PreMix	< 10 kb	****	-	-	*****	****	****
RT/PCR PreMix	< 6 kb	****	-	-	*****	***	***
RocketScript™ RT/ PCR PreMix	< 6 kb	****	-	-	*****	***	****
RocketPlex™ RT/PCR PreMix	< 6 kb	****	****	-	*****	***	****
GreenStar™ qPCR PreMix	-	***	****	-	*****	****	****
2X *GreenStar*™ qPCR Master Mix	-	***	****	-	*****	****	****
DualStar™ qPCR PreMix	-	***	*****	-	*****	****	****
Plus *DualStar*™ qPCR premix, 2X Master Mix	-	****	****	-	****	****	****
RocketScript™ RT qPCR PreMix, 2X Master Mix	-	****	*****	-	****	****	****

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DNA Amplification

AccuPower® PCR PreMix

Lyophilized PCR Master Mix with a novel *Top* DNA Polymerase

Description

Bioneer's *AccuPower*® PCR PreMix is a convenient lyophilized PCR Master Mix containing *Top* DNA polymerase, dNTPs, reaction buffer, tracking dye, and our patented stabilizer. *AccuPower*® PCR PreMix includes our super-processive *Top* DNA polymerase for the fastest nucleic acid amplification. *Top* DNA polymerase is engineered to be faster by removal of the 5'-3' exonuclease activity by *Thermus thermophilus* DNA polymerase. The result is an enzyme that is ideal for all applications that you would normally use *Taq*.

Features and Benefits

- **Stability** : *AccuPower*® PCR PreMix maintains long shelf life by using Bioneer's unique stabilizer. *AccuPower*® PCR PreMix maintains full activity after heat treatment at 95°C for 90 min, whereas standard solution-type MasterMixes will lose at least their half activity after this heat. The stabilizers in *AccuPower*® increase the half life of the enzyme in which can result the better yield the addition to significantly extending the life of the product.
- **Simplicity** : Simply add template DNA, Primers and ddH_2O to start the PCR reaction. Every *AccuPower*® PCR PreMix tube contains DNA polymerase and all other components required for PCR. No need to add sample loading buffer by the included tracking dye and precipitants required on the electrophoresis step. Also, the carry-over contamination by generation of aerosols can be minimized. This product can be used for cloning into T-vector since it generates an A overhang on amplications. PCR is convenient and fast with *AccuPower*®.
- **Enhanced Processivity** : Since *AccuPower*® PCR PreMix lacks 5'-3' Exonuclease activity, it provides superior amplification processivity relative to other polymerases. In a processivity test, using Lambda DNA (1 kb to 4 kb), *AccuPower*® PCR PreMix performed significantly better than 2 competitors' (Figure 2).
- **Sensitivity** : Sensitivity tests using both Lambda DNA (100 ng ~ 100 fg) and Human genomic DNA (100 ng ~ 100 pg) as template demonstrates equivalent or better sensitivity relating to competitor products.
- **Long PCR** : Using Lambda DNA as a template *AccuPower*® can amplify fragments up to 10 kb. With human genomic DNA as a template, *AccuPower*® offers superior amplification efficiency compared to other products, and can amplify fragments up to 4 kb.

- **Reproducibility** : *AccuPower*® PCR PreMix is manufactured under strict ISO 9001 quality control conditions to ensure reproducible PCR performance.

Application

- Target gene amplification
- cDNA amplification
- Long kb PCR
- General PCR

Specifications

- 5' to 3' exonuclease activity : No
- 3' to 5' exonuclease activity : No
- 3' – A overhang : Yes
- Fragment size : ~ 10 kb

Storage Temperature

-20 ℃.

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AccuPower® PCR PreMix

Lyophilized PCR Master Mix with a novel *Top* DNA Polymerase

■ Experimental Data

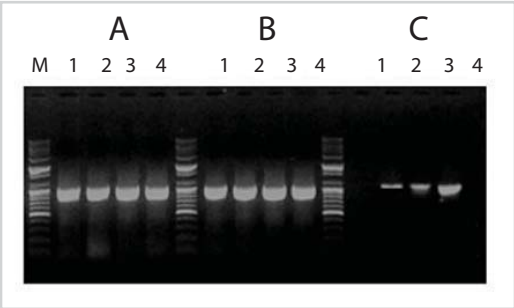

Figure 1. Comparison of the heat stability of *AccuPower*® PCR PreMix and competitor products.
AccuPower® PCR PreMix and competitors' products (solution type's Master Mix) were incubated at 95℃ for the indicated times. After incubation, PCR was performed according to each manufacturer's recommendations.
A: *AccuPower*® PCR PreMix (Lot-1)
B: *AccuPower*® PCR PreMix (Lot-2)
C: T company's *Taq* DNA polymerase
Lane 1 : 90 min Lane 2 : 60 min
Lane 3 : 40 min Lane 4 : 30 min
Lane M : 100 bp plus DNA Ladder (Bioneer, Cat. No. D-1035)

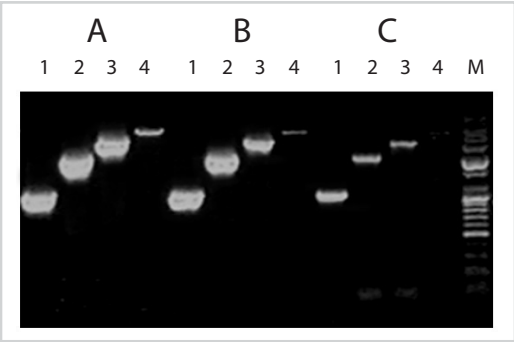

Figure 2. Comparison of processivity test for *AccuPower*® PCR PreMix and competitors' products by using Lambda DNA.
PCR Condition : 95℃ 5 min, [94℃ 30 sec, 57℃ 30 sec, 72℃ 30 sec, (30 cycles)], 72℃ 5 min.
A: *AccuPower*® PCR PreMix
B: S company's *Taq* PreMix DNA
C: T company's *Taq* PreMix DNA
Lane 1 : 1 kb fragment of Lambda
Lane 2 : 2 kb fragment of Lambda DNA
Lane 3 : 3 kb fragment of Lambda DNA
Lane 4 : 4 kb fragment of Lambda DNA
M : 100 bp plus DNA Ladder (Bioneer, Cat. No. D-1035)

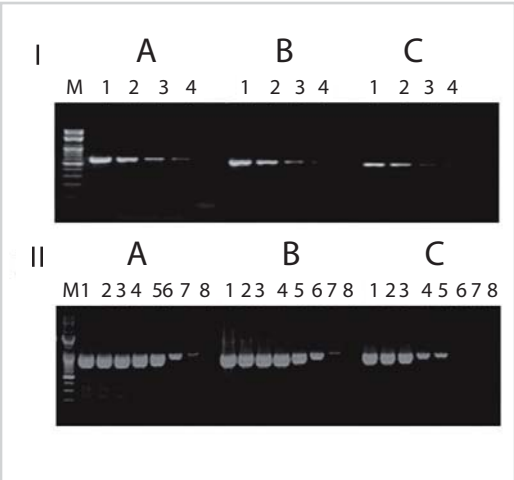

Figure 3. Comparison of sensitivity test for *AccuPower*® PreMix and competitors' products by using serial dilutions of Human genomic DNA (I) and Lambda DNA (II).
PCR Condition : 94℃ 5 min, [94℃ 1 min, 55℃ 1 min, 72℃ 1 min (30 cycles.)], 72℃ 5 min.

A : *AccuPower*® PCR PreMix
B : S company's *Taq* PreMix type

C: T company's *Taq* PreMix type
Lane 1 : 100 ng of template DNA
Lane 2 : 50 ng of template DNA
Lane 3 : 10 ng of template DNA
Lane 4 : 1 ng of template DNA
Lane 5 : 100 pg of template DNA
Lane 6 : 10 pg of template DNA
Lane 7 : 1 pg of template DNA
Lane 8 : 100 fg of template DNA
M : 100 bp plus DNA Ladder (Bioneer, Cat. No.D-1035)

AccuPower® PCR PreMix

Lyophilized PCR Master Mix with a novel *Top* DNA Polymerase

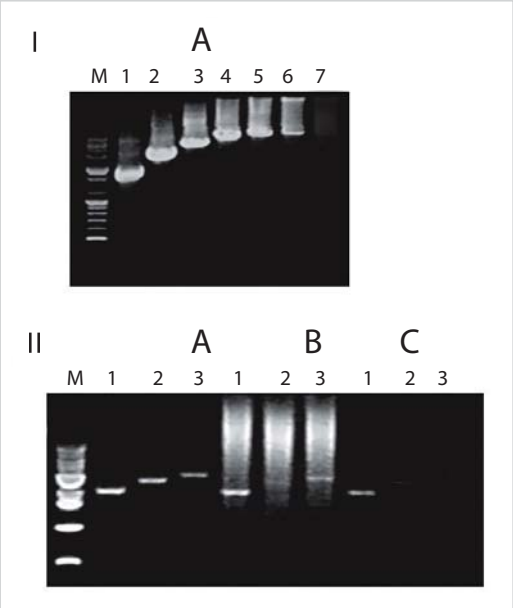

Figure 4. Comparison of long PCR for *AccuPower*® PCR PreMix and competitor products by using serial dilutions of Lambda DNA (I) and human genomic DNA (II).
PCR condition: 94℃ 5 min, [94℃ 30 sec, 68℃ 20 min, (20 cycles)], 72℃ 10 min.
A: *AccuPower*® PCR PreMix
B: S company's *Taq* PreMix type
C: T company's *Taq* PreMix type
(I) Lane 1: 2 kb PCR product Lane 2: 4 kb PCR product
Lane 3: 8 kb PCR product, Lane 4: 9 kb PCR product
Lane 5: 10 kb PCR product Lane 6: 15 kb PCR product
Lane 7: 20 kb PCR product
(II) Lane 1: 2 kb PCR product Lane 2: 3 kb PCR product
Lane 3: 4 kb PCR product
M: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)

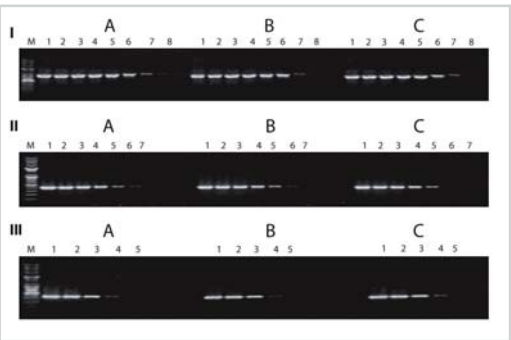

Figure 5. Reproducibility test for *AccuPower*® PCR reMix using by three different manufacturing lots with serial dilutions of Lambda DNA (I), Bacterial DNA (II) and Human genomic DNA(III).
A: *AccuPower*® PCR PreMix Lot 1
B: *AccuPower*® PCR PreMix Lot 2
C: *AccuPower*® PCR PreMix Lot 3
Lane 1: 100 ng of template DNA Lane 2: 50 ng of template DNA
Lane 3: 10 ng of template DNA Lane 4: 1 ng of template DNA
Lane 5: 100 pg of template DNA Lane 6: 10 pg of template DNA
Lane 7: 1 pg of template DNA Lane 8: 100 fg of template DNA
M: 100 bp plus DNA Ladder (Cat. No. D-1035)

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AccuPower® PCR PreMix

Lyophilized PCR Master Mix with a novel *Top* DNA Polymerase

■ Ordering Information

Cat. No.	Product Description
K-2010	*AccuPower*® PCR PreMix, 0.5ml thin-wall tubes with attached cap / 100 tubes, 20 µl reaction
K-2011	*AccuPower*® PCR PreMix, 0.5 mL thin wall microtube / 100 tubes, 50 µl reaction
K-2012	*AccuPower*® PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2013	*AccuPower*® PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2014	*AccuPower*® PCR PreMix, 0.5ml thin-wall tubes with attached cap / 500 tubes, 20 ul reaction
K-2016	*AccuPower*® PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2017	*AccuPower*® PCR PreMix, 0.2 mL thin wall 8-strip tubes with attached individual caps / 500 tubes, 50 µl reaction
K-2018	*AccuPower*® PCR Master Mix, 1 ml of 2 X Master Mix solution
K-2018-1	*AccuPower*® PCR Master Mix, 10 ml of 2 X Master Mix solution
K-2080-1	*AccuPower*® PCR PreMix, thin-wall 384-well full-skirted plate, 5 µl reaction
K-2080-2	*AccuPower*® PCR PreMix, thin-wall 384-well full-skirted plate, 10 µl reaction
K-2080-3	*AccuPower*® PCR PreMix, thin-wall 384-well full-skirted plate, 20 µl reaction
K-2260-1	*AccuPower*® PCR PreMix, thin-wall 96-well flat plate, 10 µl reaction
K-2260-2	*AccuPower*® PCR PreMix, thin-wall 96-well full-skirted plate, 10 µl reaction
K-2260-3	*AccuPower*® PCR PreMix, thin-wall 96-well semi-skirted plate, 10 µl reaction
K-2260-4	*AccuPower*® PCR PreMix, thin-wall 96-well flat plate, 20 µl reaction
K-2260-5	*AccuPower*® PCR PreMix, thin-wall 96-well full-skirted plate, 20 µl reaction
K-2260-6	*AccuPower*® PCR PreMix, thin-wall 96-well semi-skirted plate, 20 µl reaction

AccuPower® Taq PCR PreMix

Lyophilized PCR Master Mix with *Taq* DNA Polymerase

Description

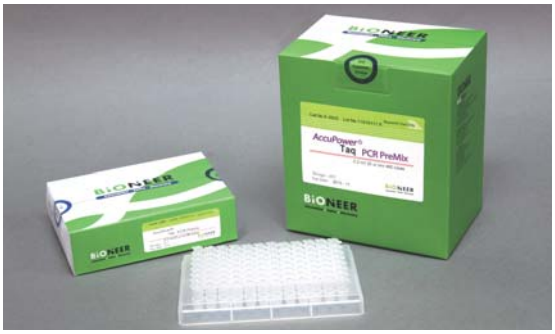
The *AccuPower® Taq* PCR PreMix is a convenient lyophilized PCR Master Mix that containing *Taq* DNA polymerase, dNTPs, reaction buffer, tracking dye and patented stabilizer, and is aliquoted into 8-strip PCR tubes (0.5 ml tubes as well as 96 and 384 well plates are also available). The premix retains its activity for over a month at room temperature, and is stable for two years in -20°C freezer. *AccuPower® Taq* PCR PreMix is available with or without tracking dye dependent on your application. If you purchase the premix with tracking dye, reactions can be loaded on agarose gels without adding loading buffer.

Features and Benefits

- **Flexible** : *AccuPower® Taq* PCR PreMix is ideal for a wide range of PCR applications.
- Eliminates contamination in the lab : All reaction components including thermostable DNA polymerase and dNTPs required for PCR, are contained within each tube and in a lyophilized "PreMix" form.
- Just add template and primers and start your reaction. dNTPs, buffer and enzyme are provided.
- **Stability** : Stable at room temperature for a month, at 4°C for one year and for 2 years in -20°C freezer.
- **Reproducibility** : Bioneer's strict ISO 9001 quality production system ensures that your results will be reproducible experiments after experiments.

Application

- Routine PCR.
- Primer extension.
- Gene sequencing.
- TA cloning.



Specifications

- 5' to 3' exonuclease : Yes
- 3' to 5' exonuclease : No
- 3′ – A overhang : Yes
- Source : *Thermus acquaticus*

Experimental Data

Figure 1. Comparison of amplification sensitivity between *AccuPower® Taq* PCR PreMix and four competitor's *Taq*-based PCR Master Mixes.
Target Gene: human Insulin receptor gene. Bioneer reaction mixture was amplified as follows : 95°C for 5 min, 30 cycles of 20 sec at 95°C, 20 sec at 55°C, 30 sec at 72°C. Competitor reaction mixtures were amplified according to each suppliers' protocol.
Sensitivity test: Serial dilutions of Human genomic DNA.
Lane M : 100bp DNA Ladder (Cat. No. D-1030)
Lane 1 : 10 ng Human genomic DNA
Lane 2 : 1 ng Human genomic DNA
Lane 3 : 100 pg Human genomic DNA
Lane 4 : 10 pg Human genomic DNA

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DNA Amplification

AccuPower® Taq PCR PreMix

Lyophilized PCR Master Mix with *Taq* DNA Polymerase

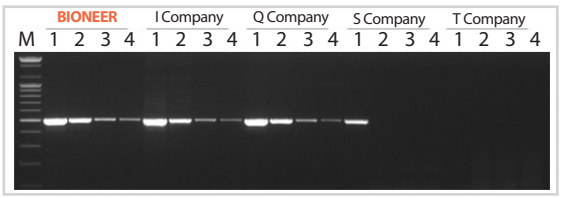


Figure 2. Comparison of amplification sensitivity between *AccuPower® Taq* PCR PreMix and four competitor's Taq-based PCR Master Mixes.
Target Gene: IRGC (Immunity-related GTPase family, cinema). The cycling conditions for *AccuPower® Taq* PCR PreMix were 95°C for 5 min, 35 cycles of 20 sec at 95°C, 20 sec at 55°C, 30 sec at 72°C. PCR reactions using other supplier's PCR Master Mix were performed according to each suppliers' protocol.
Sensitivity test. Serial dilutions of Human genomic DNA.
Lane M: 100 bp DNA Ladder (Cat. No. D-1030)
Lane 1 : 10 ng Human genomic DNA
Lane 2 : 1 ng Human genomic DNA
Lane 3 : 100 pg Human genomic DNA
Lane 4 : 10 pg Human genomic DNA

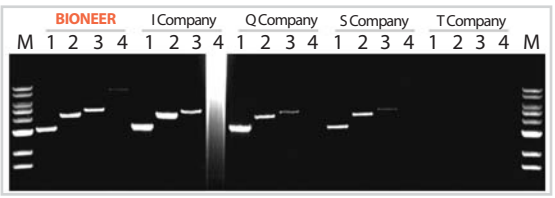


Figure 3. Comparison of PCR amplification of long targets between *AccuPower® Taq* PCR PreMix from Bioneer and other suppliers' PCR Master Mixes.
The cycling conditions for *AccuPower® Taq* PCR PreMix were 95°C for 5 min, 30 cycles of 20 sec at 95°C, 20 sec at 65°C, 8 min at 68°C. PCR reactions using other suppliers' PCR Master Mix were performed according to each supplier's protocol.
Lane M : 1 kb DNA Ladder (Cat. No. D-1040)
Lane 1 : 3 kb fragment (Human tumor protein p53 gene)
Lane 2 : 4 kb fragment (Human beta globin region)
Lane 3 : 4.5 kb fragment (Human DNA cross-link repair 1A gene)
Lane 4 : 8 kb fragment (Human hemoglobin epsilon 1 gene)

■ Ordering Information

Cat. No.	Product Description
K-2601	*AccuPower® Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction,
K-2602	*AccuPower® Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2603	*AccuPower® Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2604	*AccuPower® Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2609	*Taq* PCR MasterMix, 2.5ml of 2X Master Mix solution
K-2610	*Taq* PCR MasterMix, 25ml of 2X Master Mix solution. 12.5 ml * 2 tubes

01
DNA Amplification

AccuPower® PCR PreMix (with UDG)

Lyophilized Master Mix for DNA amplification, containing UDG to prevent carry-over contamination or crossover contamination

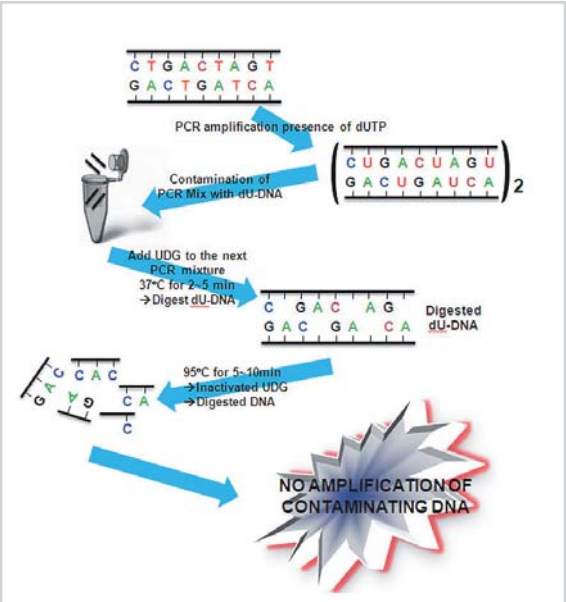
■ Description

Polymerase chain reaction (PCR) is a powerful technology that can amplify a single molecule of DNA to levels detectable on an agarose gel. Therefore, a small amount of DNA, inadvertently introduced into a reaction, can be amplified and lead to negative result. Such contaminants produced by previous PCR amplifications (termed: carry-over contamination) are common. The most common way to avoid carry-over contamination is using dUTP as a substitute for dTTP for all PCR performed in a lab and treating all PCR reactions with Uracil-DNA Glycosylase (UDG) prior to loading on a thermal cycler in order to destroy trace amounts of DNA from previous amplifications.

AccuPower® PCR PreMix (with UDG) is a ready-to-use of Master Mix that containing all components except for primers and template, in order to amplify and to detect DNA in PCR. The Master Mix combines *Top* DNA polymerase with integrated UDG carryover prevention technology to provide optimal performance with a variety of PCR detection technologies.

■ Features and Benefits

- Prevention of carryover contamination : UDG and dUTP in the MasterMix prevent the re-amplification of carryover PCR products between reactions. dUTP ensures that any amplified DNA will contain uracil, while UDG removes uracil residues from single- or double-stranded DNA, preventing dU-containing DNA from serving as template in subsequent PCR reactions. Prior to PCR, a UDG incubation step (37℃, 2 min) cleaves uracil residues from any contaminating dU-containing DNA from previous PCR reactions. UDG is then inactivated by the high temperatures during normal PCR cycling, allowing the amplification of legitimate target sequences.



- **Easy-to-use** : All reaction components including thermostable DNA polymerase and dNTPs required for PCR, are contained within each tube and in a lyophilized "PreMix" form. The user needs only to add template DNA, primers and water. Materials necessary for loading agarose gels for electrophoresis are also added in the reaction, eliminating the need to add loading dye after PCR is completed.
- **Sensitivity** : Sensitivity test using Lambda DNA (100 ng ~ 100 fg) and Human genomic DNA (100ng~100pg) as template shows significantly better sensitivity compared to other competitor products.
- **Long PCR** : by Using Lambda DNA as a template, *AccuPower* ® can amplify fragments up to 10 kb. With human genomic DNA as a template, *AccuPower*® offers superior amplification efficiency compared to other products, and can amplify fragments up to 4 kb.
- **Eliminates contamination in the lab** : *AccuPower*® PCR PreMix (with UDG) combines *Top* DNA polymerase with integrated UDG carryover prevention technology to provide optimal performance and prevent carry-over contamination in your lab.
- **Reproducibility** : *AccuPower*® PCR PreMix is manufactured under the strict ISO 9001 quality control conditions to ensure reproducible PCR performance.

■ Application

- Polymerase chain reaction (PCR)
- Primer extension
- TA cloning
- Gene sequencing
- Molecular Diagnosis

■ Specifications

- 5' to 3' exonuclease activity: No
- 3' to 5' exonuclease activity: No
- 3' – A overhang : Yes
- Fragment size: ~ 10 kb

■ Storage Temperature

-20℃ .

01 DNA Amplification

AccuPower® PCR PreMix (with UDG)

Lyophilized Master Mix for DNA amplification, containing UDG to prevent carry-over contamination or crossover contamination

■ Experimental Data

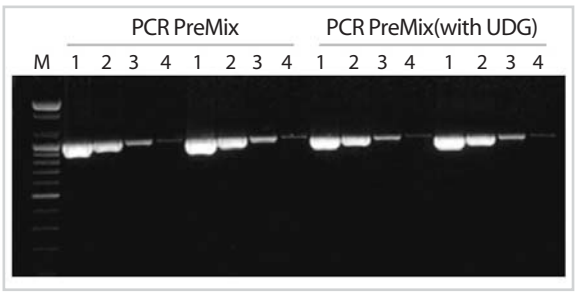


Figure 1. Comparison of sensitivity between *AccuPower*® PCR PreMix and *AccuPower*® PCR PreMix (with UDG).

Sensitivity test was performed by using serial dilutions of human genomic DNA. The reaction mixture was incubated at 37°C for 2 min followed by 95°C for 5 min and 30 cycles of 20 sec at 95°C, 20 sec at 55°C, 30 sec at 72°C. *AccuPower*® PCR PreMix (with UDG) contains dUTP in addition to dATP, dGTP, dCTP and dTTP.
The amount of DNA used to test is represented below.
Lane 1: 10 ng of Human genomic DNA
Lane 2: 1 ng of Human genomic DNA
Lane 3: 100 pg of Human genomic DNA
Lane 4: 10 pg of Human genomic DNA
M: 100 bp DNA ladder (Cat. No. D-1030-1)

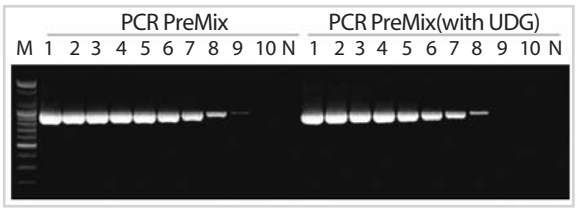


Figure 2. Comparison of amplification sensitivity using standard PCR products (without uracil) between *AccuPower*® PCR PreMix and *AccuPower*® PCR PreMix (with UDG).

Amplification quality test was performed by using serially diluted PCR products which were amplified without uracil. Negative controls were also included for both products. Each reaction mixture was incubated at 37°C for 2 min, followed by 95°C for 5 min and 30 cycles of 20 sec at 95°C, 20 sec at 55°C, 30 sec at 72°C. *AccuPower*® PCR PreMix (with UDG) contains dUTP in addition to dATP, dGTP, dCTP and dTTP.
The copy number of PCR products (copy) used to test is represented below.
Lane 1: 10^{11} copies Lane 2: 10^{10} copies Lane 3: 10^{9} copies
Lane 4: 10^{8} copies Lane 5: 10^{7} copies Lane 6: 10^{6} copies
Lane 7: 10^{5} copies Lane 8: 10^{4} copies Lane 9: 10^{3} copies
Lane 10: 10^{2} copies Lane N: No template control
M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030-1)

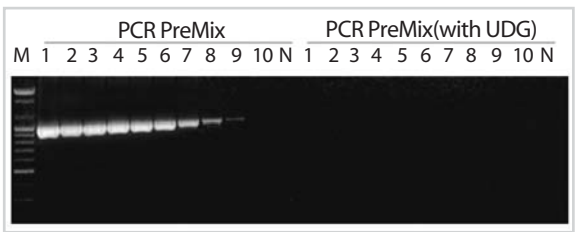


Figure 3. Efficiency of carry-over contamination prevention by using uracil DNA glycosylase when amplifying PCR products containing uracil bases.

A test of uracil DNA glycosylase efficiency was performed by using serially diluted PCR products containing uracil bases. *AccuPower*® PCR PreMix (with UDG) was compared with standard *AccuPower*® PCR PreMix. Each reaction mixture was incubated at 37°C for 2 min, followed by 95°C for 5 min and 30 cycles of 20 sec at 95°C, 20 sec at 55°C, 30 sec at 72°C. *AccuPower*® PCR PreMix (with UDG) contains dUTP in addition to dATP, dGTP, dCTP and dTTP.
The copy number of PCR products used to test is represented below.
Lane 1: 10^{11} copies Lane 2: 10^{10} copies Lane 3: 10^{9} copies
Lane 4: 10^{8} copies Lane 5: 10^{7} copies Lane 6: 10^{6} copies
Lane 7: 10^{5} copies Lane 8: 10^{4} copies Lane 9: 10^{3} copies
Lane 10: 10^{2} copies Lane N: No template control
M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030-1)

■ Ordering Information

Cat. No.	Product Description
K-2012-1	*AccuPower*® PCR PreMix(with UDG), 0.2 ml thin-wall tubes with attached cap / 96 tubes, 20 µl reaction
K-2016-1	*AccuPower*® PCR PreMix(with UDG), 0.2 ml thin-wall tubes with attached cap / 480 tubes, 20 µl reaction

AccuPower® HotStart PCR PreMix

Lyophilized Master Mix for highly specific DNA amplification, applied unique *Pyro*HotStart technology using *Top* DNA Polymerase (inactivated 5'->3' Exonuclease activity)

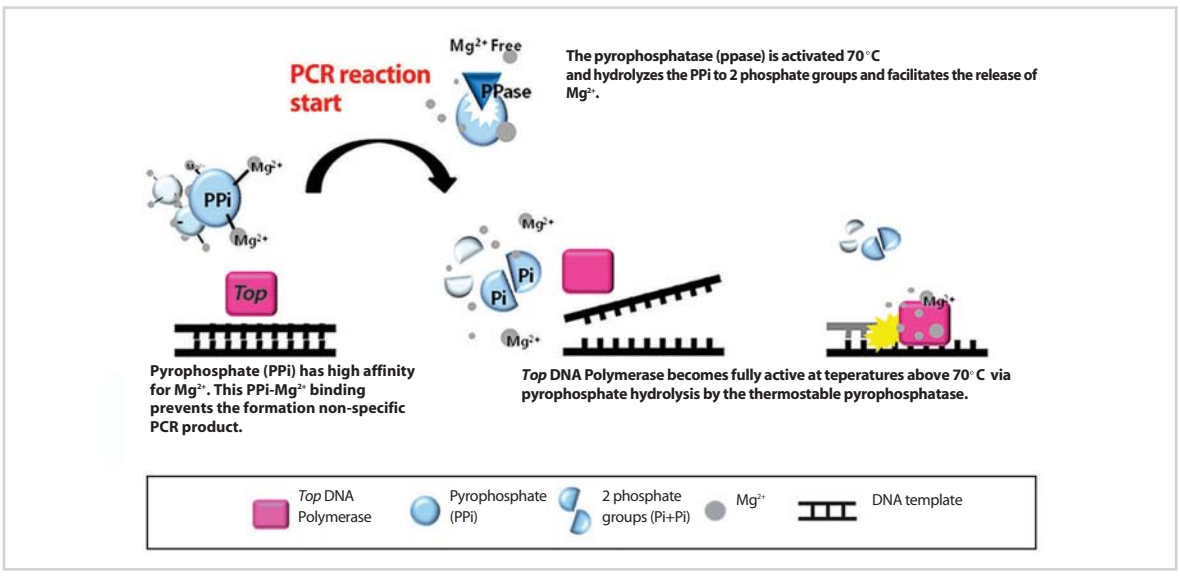
■ Description

AccuPower® HotStart PCR PreMix is a lyophilized PCR Master Mix containing a thermostable DNA polymerase, thermostable pyrophosphatase, reaction buffer, dNTPs, tracking dye, and patented stabilizer in a ready to use Hotstart PCR Master Mix.

Bioneer uses a unique enzyme-mediated HotStart PCR that provides robust and reliable results. Bioneer's *Top* DNA Polymerase is inhibited at lower temperatures (< 70°C) by pyrophosphate. However, *Top* DNA Polymerase is rendered fully active at temperatures above 70°C via pyrophosphate hydrolysis with our thermostable pyrophosphatase. This prevents the formation of mis-primed products and primer-dimers during the reaction set up process resulting in improved PCR specificity. It is ideal for nucleic acid amplification reactions involving in complex genomic or cDNA templates, very low copy targets, and multiplex reactions.

■ Features and Benefits

- Robust yields due to novel Enzyme-Mediated HotStart PCR : *AccuPower*® HotStart PCR PreMix uses a novel HotStart method, that utilizes Pyrophoshosphate (hereinafter referred as "PPi"), a thermostable pyrophosphatase (hereinafter as "PPase"), Mg^{2+}, and DNA polymerase. It shows robust yields in long-cycle PCR with low copy targets by increasing specificity and sensitivity, while delaying the plateau effect.
- **Specificity** : Pyrophosphate (PPi) has very high affinity with Mg^{2+} ion required for DNA polymerases. Thus in the presence of excess PPi, DNA polymerase is not active. *AccuPower*® HotStart PCR PreMix uses excess PPi to eliminate the production of non-specific product during PCR setup. However, during the first cycle of PCR, at temperatures above 70°C, the added thermostable PPase cleaves PPi and releases the bound Mg^{2+}, thereby activating the DNA polymerase. Thus non-specific amplification is suppressed during set-up and at lower temperatures, and the Polymerase is fully active after the first incubation at 95°C. In addition, the presence of thermostable PPase delays the plateau phase of PCR by removing the PPi that normally accumulates during amplification, allowing you to amplify low copy targets with confidence.



01
DNA Amplification

AccuPower® HotStart PCR PreMix

Lyophilized Master Mix for highly specific DNA amplification, applied unique *Pyro*HotStart technology using *Top* DNA Polymerase (inactivated 5'->3' Exonuclease activity)

- **Flexibility** : Ideal for many PCR applications and a variety of fragment sizes up to 12 kb.
- **Stability** : Our unique stabilizer allows full activity after storage at room temperature for a month, at 4°C for one year and for 2 years in -20°C freezer.
- **Simplicity** : Just add template DNA, primers and water to start your reaction. dNTPs, buffer and enzyme are provided.
- **Reproducibility** : *AccuPower*® HotStart PCR PreMix is manufactured under the strict ISO 9001 quality control conditions to ensure reproducible PCR performance, experiment after the experiment.

Application

- Genome template's PCR.
- Low copy target's PCR.
- Multiple primer pair's PCR.
- cDNA template's PCR.
- Molecular Diagnosis.

Specifications

- 5' to 3' exonuclease activity : No
- 3' to 5' exonuclease activity : No
- 3' – A overhang : Yes
- Fragment size : ~ 12 kb

Experimental Data

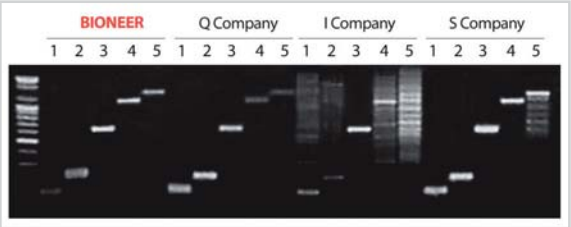


Figure 1. Specificity Test
Specificity comparison between *AccuPower*® HotStart PCR PreMix and competitor products.
Each gene was amplifed from 10 ng of human genomic DNA. The cycling conditions were 95°C for 5 min, 30 cycles of 95°C for 20 sec, 55°C for 40 sec, and 72°C for 1 min, and 72°C for 5 min for final extension.
Lane 1: P75/P73 primer set (139 bp)
Lane 2: P55/P53 primer set (211 bp)
Lane 3: P75/P83 primer set (618 bp)
Lane 4: P55/P73 primer ser (1,082 bp)
Lane 5: P65/P83 primer set (1,296 bp)
M: 100bp DNA Ladder (Cat. No. D-1030)

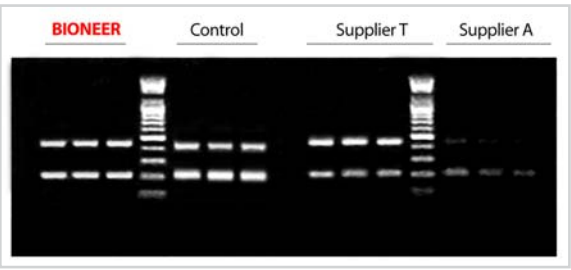


Figure 2. Specificity comparison of multiplex PCR with various HotStart PCR reagents.
Each PCR mixture with 2 ng of human genomic DNA and 2 pairs of primers (p53 + p55 and p55 + p63) was incubated for 2 hours at 37°C prior to performing multiplex PCR.
A: *AccuPower*® *HotStart* PCR PreMix
B: Control (Normal Polymerase)
C: Company "T" Antibody based HotStart *Taq* DNA polymerase (0.5U)
D: A company's Antibody based HotStart *Taq* DNA polymerase (1.0U)
M: 100bp DNA Ladder (Cat. No. D-1030)

AccuPower® HotStart PCR PreMix

Lyophilized Master Mix for highly specific DNA amplification, applied unique *Pyro*HotStart technology using *Top* DNA Polymerase (inactivated 5'->3' Exonuclease activity)

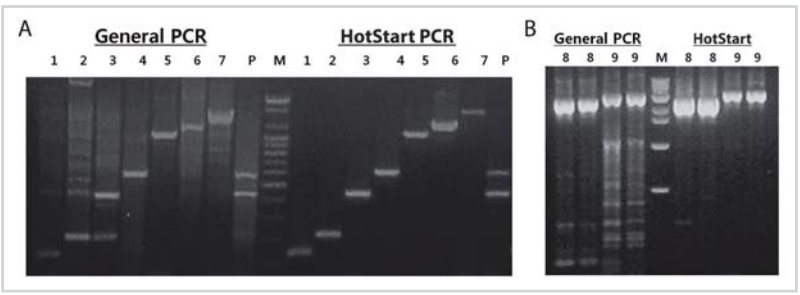


Figure 3. Specificity Test : Human Genomic DNA
Specificity comparison between *AccuPower* ®HotStart PCR PreMix and standard (control) DNA polymerase.
50 ng human genomic DNA was amplified into 2.5 - 3 kb fragments with each polymerase.
Bioneer: *AccuPower* ®HotStart PCR PreMix, Control: Normal polymerase
Lane 1 : P75/P73 primer set (139 bp) Lane 2 : P55/P53 primer set (211 bp)
Lane 3 : P55/P63 primer set (447 bp) Lane 4 : P75/P83 primer set (618 bp)
Lane 5 : P55/P73 primer ser (1,082 bp) Lane 6 : P65/P83 primer set (1,296 bp)
Lane 7 : P55/P83 primer set (1,561 bp) Lane 8 : 2.5 kb Lane 9 : 3.0 kb
M 1 : 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)
M2 : 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)

■ Ordering Information

Cat. No.	Product Description
K-5050	*AccuPower*® HotStart PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-5051	*AccuPower*® HotStart PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-5052	*AccuPower*® HotStart PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-5053	*AccuPower*® HotStart PCR PreMix, 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction
K-5057	*AccuPower*® HotStart PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction

01
DNA Amplification

AccuPower® PyroHotStart Taq PCR PreMix

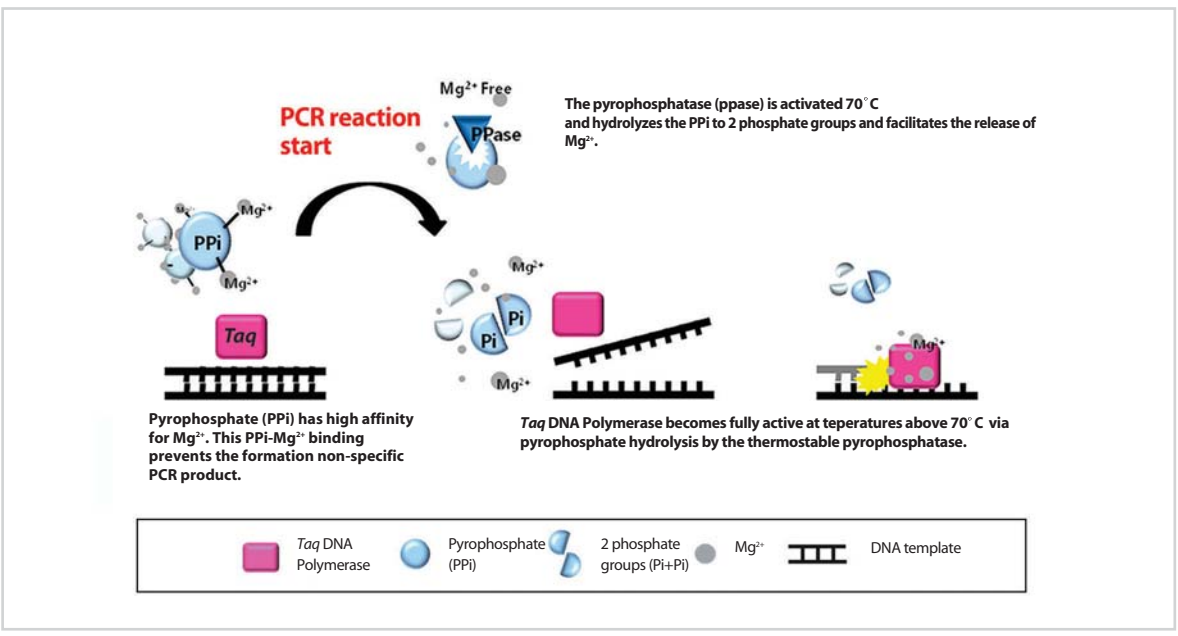
Lyophilized Master Mix for highly specific DNA amplification, applied unique *Pyro*HotStart technology using *Taq* DNA Polymerase

■ Description

AccuPower®PyroHotStart Taq PCR PreMix is a lyophilized PCR Master Mix containing a thermostable DNA polymerase, thermostable pyrophosphatase, reaction buffer, dNTPs, tracking dye, and patented stabilizer in a ready to use HotStart PCR Master Mix. Bioneer's *Taq* DNA Polymerase is inhibited at lower temperatures (< 70°C) by pyrophosphate. However, *Taq* DNA Polymerase is rendered fully active over 70°C via pyrophosphate hydrolysis with our thermostable pyrophosphatase. This prevents the formation of mis-primed products and primer-dimers during the reaction set up process resulting in improved PCR specificity. It is ideal for nucleic acid amplification reactions involving complex genomic or cDNA templates, very low copy targets, and multiplex reactions.

■ Features and Benefits

- **Specificity** : Pyrophosphate (PPi) has very high affinity with Mg^{2+} ion required for DNA polymerases. Thus in the presence of an excess PPi, DNA polymerase is not active. *AccuPower®* HotStart PCR PreMix uses an excess PPi to eliminate the production of non-specific product during PCR setup. However, during the first cycle of PCR, at temperatures over 70°C, the added thermostable PPase cleaves PPi and releases the bound Mg^{2+}, thereby activating the DNA polymerase. Thus non-specific amplification is suppressed during set-up and at lower temperatures, and the Polymerase is fully active after the first incubation at 95°C. In addition, the presence of thermostable PPase delays the plateau phase of PCR by removing the PPi that normally accumulates during amplification, allowing you to amplify low copy targets with confidence.



01
DNA Amplification

AccuPower® *PyroHotStart Taq* PCR PreMix

Lyophilized Master Mix for highly specific DNA amplification, applied unique *Pyro*HotStart technology using *Taq* DNA Polymerase

- **Stability** : Stable at room temperature for a month, at 4°C for one year and for 2 years in -20°C
- **Ease-of-Use** : All reaction components required for PCR, including thermostable DNA polymerase and dNTPs are contained within each tube and in a lyophilized "PreMix" form. The user needs only to add template DNA, primers and water. Materials necessary for loading agarose gels for electrophoresis are also added in the reaction, eliminating the need to add loading dye after the PCR is completed.
- **Reproducibility** : *AccuPower* ® products are manufactured under the strict ISO 9001 quality control conditions to ensure reproducible PCR result.

Application

- High specificity PCR.
- High sensitivity PCR.
- Low-copy target PCR.
- Multiple primer pairs PCR.
- cDNA template PCR.
- TA cloning.

Specifications

- 5' to 3' exonuclease: Yes
- 3' to 5' exonuclease: No
- 3' – A overhang: Yes
- Fragment size: ~ 5 kb

Experimental Data

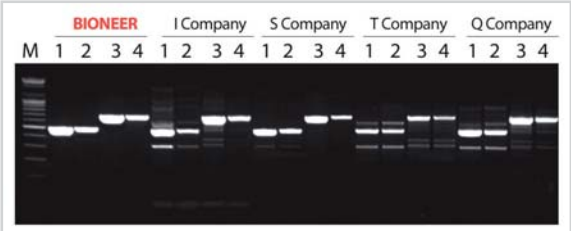


Figure 1. Comparison of PCR amplification specificity between *AccuPower*® *PyroHotStart Taq* PCR PreMix from Bioneer and other suppliers' HotStart PCR Master Mix.
PCR reactions were performed according to each supplier's protocol. The PrP gene was amplified from human genomic DNA with two different primer sets, separately. This data shows that *AccuPower*® *PyroHotStart Taq* PCR PreMix has higher amplification efficiency and specificity than other suppliers' HotStart PCR Master Mixes.
Lane 1 : 100 ng DNA PrP primer set (500 bp)
Lane 2 : 10 ng DNA PrP primer set (500 bp)
Lane 3 : 100 ng DNA PrP primer set (705 bp)
Lane 4 : 10 ng DNA PrP primer set (705 bp)
Lane M : 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

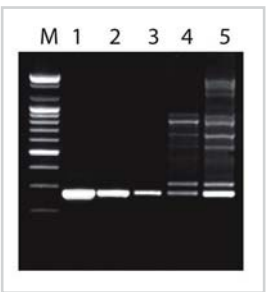


Figure 2. Comparison of PCR amplification specificity between *AccuPower*® *PyroHotStart Taq* PCR PreMix from Bioneer and other suppliers' HotStart PCR Master Mixes.

The ApoE gene was amplifed from 100 ng of human genomic DNA (The PCR product size is 268bp). This data shows that *AccuPower*® *PyroHotStart Taq* PCR PreMix has higher amplificition efficiency and specificity than other suppliers ' HotStart PCR Master Mixes.

Lane 1 : *AccuPower*® *PyroHotStart Taq* PCR PreMix
Lane 2 : Supplier I HotStart *Taq* PCR PreMix
Lane 3 : Supplier S HotStart *Taq* PCR Master Mix
Lane 4 : Supplier T HotStart *Taq* PCR Master Mix
Lane 5 : Supplier Q HotStart *Taq* PCR Master Mix
Lane M : 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

01 DNA Amplification

AccuPower® *PyroHotStart Taq* PCR PreMix

Lyophilized Master Mix for highly specific DNA amplification, applied unique *Pyro*HotStart technology using *Taq* DNA Polymerase

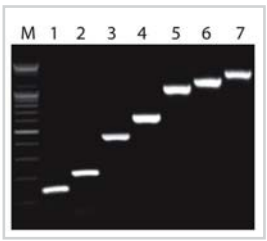


Figure 3. *AccuPower*® *PyroHotStart Taq* PCR PreMix has high amplification efficiency and specificity. Specificity test was performed by using 7 different sets of primers targeting the P53 gene. 10 ng of human genomic DNA was used for each PCR reaction. The cycling conditions were 95℃ for 5 min, 30 cycles of 95℃ for 20 sec, 55℃ for 40 sec, and 72℃ for 1 min, and 72℃ for 5 min for final extension.

Lane 1 : P75/73 primer set (139 bp)
Lane 2 : P55/53 primer set (211 bp)
Lane 3 : P55/63 primer set (447 bp)
Lane 4 : P75/83 primer set (618 bp)
Lane 5 : P55/73 primer set (1,082bp)
Lane 6 : P65/83 primer set (1,296 bp)
Lane 7 : P55/83 primer set (1,561 bp)
Lane M : 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

Figure 4. Comparison of PCR amplification between *AccuPower*® *PyroHotStart Taq* PCR PreMix from Bioneer and other suppliers' *Hot Start* PCR Master Mixes.

Sensitivity test was performed by amplifying the IRGC gene from a serial dilution of human genomic DNA. This data shows that *AccuPower*® *PyroHotStart Taq* PCR PreMix has higher amplification efficiency than other suppliers' Hot Start PCR Master Mixes.

Lane 1 : 10 ng Human genomic DNA
Lane 2 : 1 ng Human genomic DNA
Lane 3 : 100 pg Human genomic DNA
Lane 4 : 10 pg Human genomic DNA
Lane M : 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

Figure 5. Comparison of cDNA template amplification between *AccuPower*® *PyroHotStart Taq* PCR PreMix and other suppliers' HotStart PCR Master Mixes.

cDNA synthesized from 10-fold serial-diluted human total RNA from 10 ng to 10 pg using *AccuPower*® *RocketScript*™ Cycle RT PreMix (Bioneer, Cat. No. K-2201) was used as a template for PCR amplification. This data shows that *AccuPower*® *PyroHotStart Taq* PCR PreMix has higher amplification efficiency than other suppliers' HotStart PCR Master Mixes.

Lane 1 : 10 ng Human Total cDNA
Lane 2 : 1 ng Human Total cDNA
Lane 3 : 100 pg Human Total cDNA
Lane 4 : 10 pg Human Total cDNA
Lane M : 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

■ Ordering Information

Cat. No.	Product Description
K-2611	*AccuPower*® *PyroHotStart Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2612	*AccuPower*® *PyroHotStart Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2613	*AccuPower*® *PyroHotStart Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2614	*AccuPower*® *PyroHotStart Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction

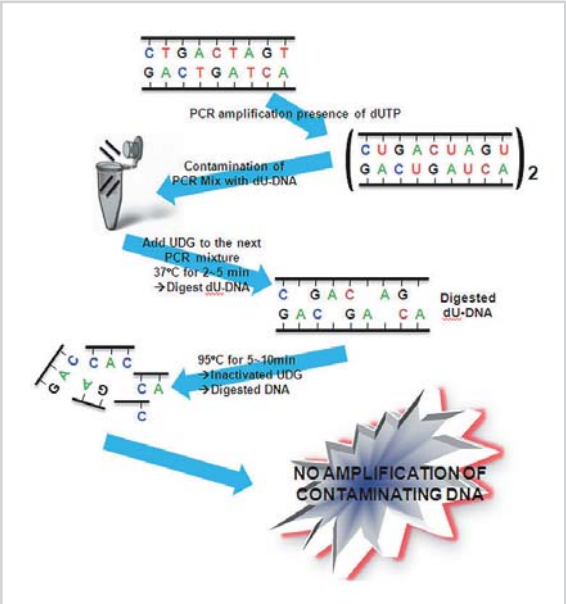
AccuPower® HotStart PCR PreMix (with UDG)

HotStart PCR Master Mix, containing UDG to prevent carry-over contamination

Description

PCR is a powerful technique that can amplify a single molecule of DNA to levels detectable on an agarose gel. Therefore, a small amount of DNA inadvertently introduced into a reaction can be amplified and lead to negative result. Such contaminants are common and may be products from previous PCR amplifications (termed: carry-over contamination). The most common way to avoid carry-over contamination is using dUTP as a substitute for dTTP for all PCR performed in a lab and treating all PCR reactions with Uracil-DNA Glycosylase (UDG) prior to loading on a thermal cycler in order to destroy trace amounts of DNA from previous amplifications.

AccuPower® HotStart PCR PreMix (with UDG) is a ready-to-use Master Mix containing all components, except primers and template, for the amplification and detection of DNA from PCR. The Master Mix combines *Top* DNA polymerase with Enzyme-mediated HotStart technology with integrated UDG carryover prevention technology to provide optimal performance with a variety of PCR detection technologies.



Features and Benefits

- **Prevention of carryover contamination** : UDG and dUTP in the MasterMix prevent the re-amplification of carryover PCR products between reactions. dUTP ensures that any amplified DNA will contain uracil, while UDG removes uracil residues from single- or double-stranded DNA, preventing dU-containing DNA from serving as template in subsequent PCR reactions. Prior to PCR, a UDG incubation step (37°C, 2 min) cleaves uracil residues from any contaminating dU-containing DNA from previous PCR reactions. UDG is than inactivated by the high temperatures during normal PCR cycling, allowing the amplification of legitimate target sequences.
- **Specificity** : Pyrophosphate (PPi) has high affinity with Mg^{2+} ion required for DNA polymerases. Thus in the presence of an excess PPi, DNA polymerase is not activated. *AccuPower*® HotStart PCR PreMix uses excess PPi to eliminate the production of non-specific product during PCR setup. However, during the first cycle of PCR, at temperatures over 70°C, the added thermostable PPase cleaves PPi and releases the bound Mg^{2+}, thereby activating the DNA polymerase. Thus non-specific amplification is suppressed during set-up at lower temperatures, and the polymerase is fully activated after the first incubation at 95°C. In addition, presence of thermostable PPase delays the plateau phase of PCR by removing the PPi that normally accumulates during amplification, allowing you to amplify at low copy targets with confidence.
- **Easy-to-use** : All reaction components required for PCR, including thermostable DNA polymerase and dNTPs are contained within each tube and in a lyophilized "PreMix" form. The user needs only to add template DNA, primers and water. Materials necessary for loading agarose gels for electrophoresis are also added in the reaction, eliminating the need to add loading dye after PCR is completed.
- **Reproducibility** : *AccuPower*® products are manufactured under strict ISO 9001 quality control conditions to ensure reproducible PCR performance, experiment after experiment.

01
DNA Amplification

AccuPower® HotStart PCR PreMix (with UDG)

HotStart PCR Master Mix, containing UDG to prevent carry-over contamination

Application

- Genome template's PCR
- Low copy target's PCR
- Multiple primer pair's PCR
- cDNA template's PCR
- Molecular Diagnosis

Storage Temperature

-20℃.

Specifications

- 5' to 3' exonuclease activity: No
- 3' to 5' exonuclease activity: No
- 3' – A overhang: Yes
- Fragment size: ~ 12 kb

Experimental Data

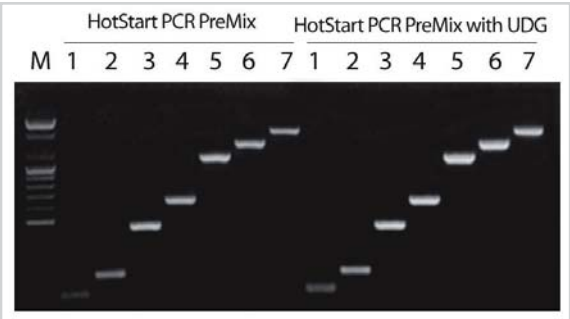


Figure 1. Comparison of specificity between *AccuPower*® HotStart PCR PreMix and *AccuPower*® HotStart PCR PreMix (with UDG).

Specificity test was operated using 7 pairs of primers targeting P53 gene. Reaction mixture was incubated at 37℃ for 2 min followed by 95℃ for 5 min, 30 cycles of 20 sec at 95℃, 40 sec at 55℃, 1 min at 72℃. *AccuPower*® HotStart PCR PreMix(with UDG) contains dUTP besides dATP, dGTP, dCTP and dTTP.

The amount of DNA(human) used to test is 10 ng and size of PCR amplicon size each lane is represented below.

Lane 1: 139 bp Lane 2: 211 bp Lane 3: 447 bp
Lane 4: 618 bp Lane 5: 1082 bp Lane 6: 1,296 bp
Lane 7: 1,561 bp
M: 100 bp plus DNA Ladder (Bioneer, Cat. No. D-1030-1)

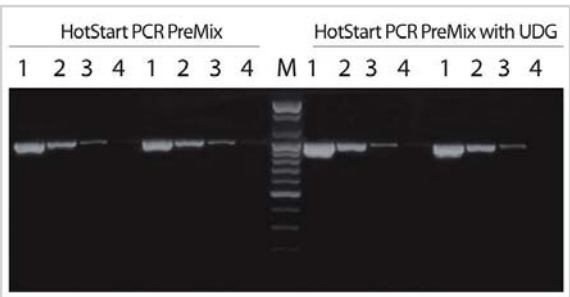


Figure 2. Comparison of sensitivity between *AccuPower*® HotStart PCR PreMix and *AccuPower*® HotStart PCR PreMix (with UDG).

Sensitivity test was operated using serial diluted human genomic DNA. Reaction mixture was incubated at 37℃ for 2 min followed by, 95℃ for 5 min, 30 cycles of 20 sec at 95℃, 20 sec at 55℃, 30 sec at 72℃. *AccuPower*® HotStart PCR PreMix (with UDG) contains dUTP besides dATP, dGTP, dCTP and dTTP.

The amount of DNA used to test is represented below.
Lane 1: 10 ng of Human genomic DNA
Lane 2: 1 ng of Human genomic DNA
Lane 3: 100 pg of Human genomic DNA
Lane 4: 10 pg of Human genomic DNA
M: 100 bp plus DNA Ladder (Bioneer, Cat. No. D-1030-1)

AccuPower® HotStart PCR PreMix (with UDG)

HotStart PCR Master Mix, containing UDG to prevent carry-over contamination

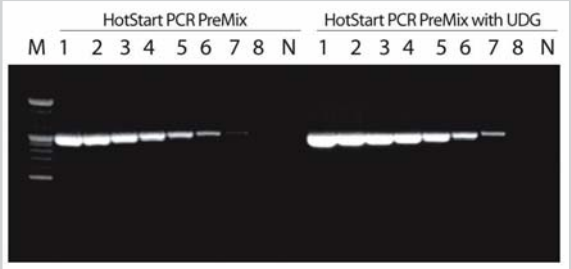


Figure 3. Comparison of amplification quality using PCR products(not including uracil base) between *AccuPower*® HotStart PCR PreMix and *AccuPower*® HotStart PCR PreMix (with UDG).

Amplification quality test was operated using serial diluted PCR products not including uracil base. *AccuPower*® HotStart PCR PreMix was also tested for negative control. Reaction mixture was incubated at 37℃ for 2 min followed by 95℃ for 5 min, 30 cycles of 20 sec at 95℃, 20 sec at 55℃, 30 sec at 72℃. *AccuPower*® HotStart PCR PreMix (with UDG) contains dUTP besides dATP, dGTP, dCTP and dTTP.

The copy number of PCR products used to test are represented below.

Lane 1: 10^{11} copies Lane 2: 10^{10} copies Lane 3: 10^{9} copies
Lane 4: 10^{8} copies Lane 5: 10^{7} copies Lane 6: 10^{6} copies
Lane 7: 10^{5} copies Lane 8: 10^{4} copies
Lane N: No template control
M: 100 bp plus DNA Ladder (Bioneer, Cat. No. D-1030-1)

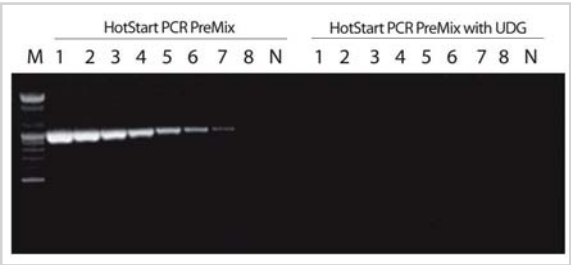


Figure 4. Efficiency of uracil DNA glycosylase using PCR product (including uracil base).

Efficiency test of uracil DNA glycosylase was operated using serial diluted PCR products including uracil base. *AccuPower*® HotStart PCR PreMix was also tested for negative control. Reaction mixture was incubated at 37℃ for 2 min followed by 95℃ for 5 min, 30 cycles of 20 sec at 95℃, 20 sec at 55℃, 30 sec at 72℃. *AccuPower*® HotStart PCR PreMix (with UDG) contains dUTP besides dATP, dGTP, dCTP and dTTP.

The copy number of PCR products used to test are represented below.

Lane 1: 10^{11} copies Lane 2: 10^{10} copies Lane 3: 10^{9} copies
Lane 4: 10^{8} copies Lane 5: 10^{7} copies Lane 6: 10^{6} copies
Lane 7: 10^{5} copies Lane 8: 10^{4} copies
Lane N: No template control
M: 100 bp plus DNA Ladder (Bioneer, Cat. No. D-1030-1)

■ Ordering Information

Cat. No.	Product Description
K-5050-1	*AccuPower*® HotStart PCR PreMix (with UDG), 0.2 ml thin-wall tubes with attached cap / 96 tubes, 20 µl reaction
K-5051-1	*AccuPower*® HotStart PCR PreMix (with UDG), 0.2 ml thin-wall tubes with attached cap / 480 tubes, 20 µl reaction

01
DNA Amplification

AccuPower® Pfu PCR PreMix

Lyophilized Master Mix for DNA amplification requiring high fidelity capability

Description

AccuPower® Pfu PCR PreMix is lyophilized mixture of *Pfu* DNA polymerase, dNTPs and reaction buffer in a convenient premix format. Simply add template, primers and water and mix – *AccuPower®* offers easy set-up for every PCR application.

Features and Benefits

- **High fidelity** : *AccuPower® Pfu* PCR PreMix includes high fidelity (error rate = 1.9×10^{-6}) enzyme that will reduces errors during DNA amplification.
- **High purity** : *AccuPower® Pfu* PCR PreMix is recombinant enzyme that eliminates smearing and unwanted background found in native *Pfu* enzymes.
- **Thermostability** : *Pfu has* an optimal activity that is higher than most of other thermostable polymerases, and exhibits low activity below 50°C. This results in higher specificity for your PCR reactions.
- **Stability** : To preserve the activity during storage, the PCR PreMix has been freeze-dried with a special stabilizer. Bioneer's unique stabilizing agent maintains the DNA polymerase activity for over 2 years in the freezer (-20°C).
- **Simplicity** : Mast of the reaction chemicals required for PCR such as thermostable DNA polymerase and dNTPs, are premixed into a single unit. The user simply adds template DNA, primers, and ddH_2O to start the reaction. A tracking dye and polymers for gel electrophoresis are also included in the mixture so there is no need to add any sample loading buffer.
- **Reproducibility** : *AccuPower®* products are manufactured under strict ISO 9001 quality control conditions to ensure reproducible PCR experiment.

Application

- Gene synthesis.
- Gene cloning.
- Polymerase Chain Reaction (PCR).
- Primer extension.
- Site directed mutagenesis.
- High fidelity PCR.

Specifications

- 5' to 3' exonuclease activity: No
- 3' to 5' exonuclease activity: Yes
- 3' – A overhang: No
- Fragment size: ~ 10 kb

Storage Temperature

-20℃.

Experimental Data

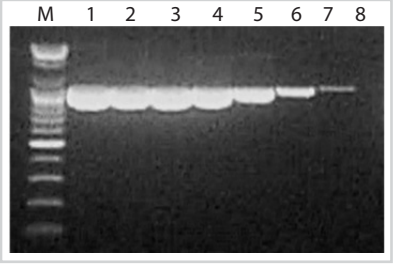


Figure 1. *AccuPower® Pfu* PCR PreMix Sensitivity test

AccuPower® Pfu PCR PreMix was tested with serial dilutions of Lambda DNA template. (The PCR product size is 1 kb) The cycling conditions were 95°C for 5 min, 30 cycles of 95°C for 30 sec, 55°C for 30 sec, and 72°C for 1 min, and 72°C for 5 min for final extension.

M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

Lane 1: 10 ng	Lane 2: 1 ng	Lane 3: 100 pg
Lane 4: 10 pg	Lane 5: 1 pg	Lane 6: 100 fg
Lane 7: 10 fg	Lane 8: No Template	

AccuPower® Pfu PCR PreMix

Lyophilized Master Mix for DNA amplification requiring high fidelity capability

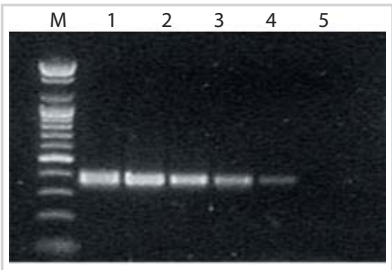
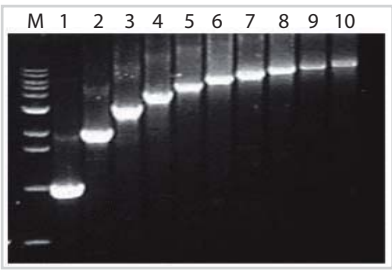


Figure 2. Sensitivity test with serial dilutions of Human DNA template.
The cycling conditions were 95°C for 5 min, 30 cycles of 95°C for 30 sec, 55°C for 30 sec, and 72°C for 1 min, and 72°C for 5 min for final extension.

Lane 1: 100 ng Lane 2: 10 ng Lane 3: 1 ng
Lane 4: 100 pg Lane 5: 10 pg Lane 6: No Template
M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)



¡Figure 3. Amplification of Human genomic DNA fragments from 1 kb to 10 kb using *AccuPower® Pfu* PCR PreMix.
The cycling conditions were 95°C for 5 min, 30 cycles of 95°C for 30 sec, 68°C for 5 min and 68°C for 5 min for final extension.

Lane 1: 1 kb fragment Lane 2: 2 kb fragment Lane 3: 3 kb fragment
Lane 4: 4 kb fragment Lane 5: 5 kb fragment Lane 6: 6 kb fragment
Lane 7: 7 kb fragment Lane 8: 8 kb fragment Lane 9: 9 kb fragment
Lane 10: 10 kb fragment
M: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)

■ Ordering Information

Cat. No.	Product Description
K-2022	*AccuPower® Pfu* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2023	*AccuPower® Pfu* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2024	*AccuPower® Pfu* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2025	*AccuPower® Pfu* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2026	*AccuPower® Pfu* PCR Master Mix, 1 ml of 2 X Master Mix solution
K-2027	*AccuPower® Pfu* PCR PreMix, 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction

01 DNA Amplification

AccuPower® ProFi Taq PCR PreMix

Lyophilized Master Mix for DNA amplification with long range kb

Description

AccuPower® ProFi Taq PCR PreMix is a convenient lyophilized PCR Master Mix containing *ProFi Taq* DNA polymerase, reaction buffer, dNTPs, tracking dye, and a patented stabilizer. *ProFi Taq* DNA polymerase in the premix is a unique recombinant *Taq* DNA polymerase that offers enhanced amplification efficiency and higher fidelity for PCR. *AccuPower® ProFi Taq* PCR PreMix is applicable to any template DNA, and especially effective in amplifying large genomic DNA fragments around 20 kb. *AccuPower® ProFi Taq* PCR PreMix provides accurate long-range amplification of standard and amplification of low-copy target, and is highly suitable for all PCR applications.

Features and Benefits

- **Long PCR** : *ProFi Taq* can amplify fragments up to 20 kb from genomic DNA or 30 kb from Lambda DNA.
- **Easy-to-use** : Just add template and primers and start your reaction. All reaction components required for PCR, including thermostable DNA polymerase and dNTPs are contained within each tube and in a lyophilized "PreMix" form.
- **Reproducibility** : Bioneer's strict quality controlled production system ensures that your results will be reproducible experiment after experiment.
- **Convenient** : Just add template and primers and start your reaction. dNTPs, buffer and enzyme are provided in convenient and personal PCR tubes or plates.
- **Stability** : Stable at room temperature for a month, for one year at 4°C and for 2 years in -20°C freezer.

Application

- Primer extension
- Long-range amplification from genomic DNA
- High amplification efficiency
- Excellent performance on difficult templates
- Amplification of low-copy targets
- High yield and high sensitivity PCR

Specifications

- 5' to 3' exonuclease: Yes
- 3' to 5' exonuclease: No
- 3' – A overhang: Yes
- PCR product size: ~ 30 kb

Experimental Data

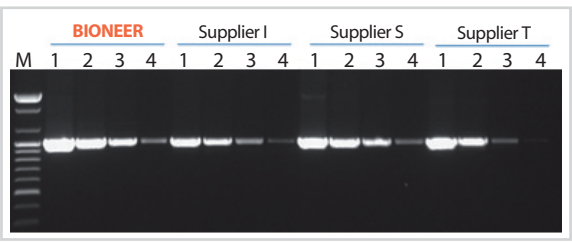


Figure 1. Comparison of PCR amplification efficiency between *AccuPower® ProFi Taq* PCR PreMix from Bioneer and other suppliers' PCR Master Mixes.

The cycling conditions for *AccuPower® ProFi Taq* PCR PreMix were 95℃ for 5 min, 30 cycles of 95℃ for 20 sec, 55℃ for 20 sec and 72℃ for 30 sec. PCR reactions using other suppliers' PCR Master Mixes were performed according to each suppliers' protocol.
Target: human insulin receptor gene
Lane M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)
Lane 1: 10 ng of human genomic DNA
Lane 2: 1 ng of human genomic DNA
Lane 3: 100 pg of human genomic DNA
Lane 4: 10 pg of human genomic DNA

AccuPower® ProFi Taq PCR PreMix

Lyophilized Master Mix for DNA amplification with long range kb

Figure 2. Comparison of PCR amplification efficiency between *AccuPower® ProFi Taq* PCR PreMix from Bioneer and other suppliers' PCR Master Mixes

cDNA synthesized from 10-fold serial-diluted human total RNA from 10 ng to 10 pg using *AccuPower® RocketScript™* Cycle RT PreMix(Bioneer, Cat. No K-2201) was used as a template for PCR amplification. The cycling conditions for *AccuPower® ProFi Taq* PCR PreMix were 95℃ for 5 min, 33 cycles of 95℃ for 20 sec, 55℃ for 20 sec and 72℃ for 30 sec. PCR reactions using other suppliers' PCR Master Mixes were performed according to each suppliers' protocol.

Target: Human GAPDH gene (Fragment size, 575 bp).
Lane M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)
Lane 1: 10 ng of human total cDNA
Lane 2: 1 ng of human total cDNA
Lane 3: 100 pg of human total cDNA
Lane 4: 10 pg of human total cDNA

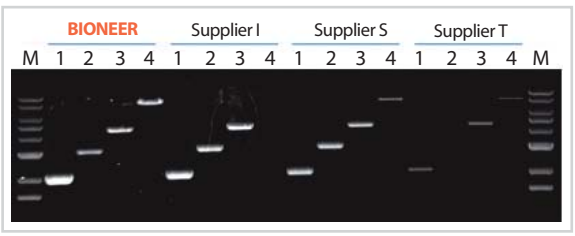


Figure 3. Comparison of PCR amplification of long targets between *AccuPower® ProFi Taq* PCR PreMix from Bioneer and other suppliers' PCR Master Mixes

The cycling conditions for *AccuPower® ProFi Taq* PCR PreMix were 95℃ for 5 min, 30 cycles of 95℃ for 20 sec, 65℃ for 20 sec and 68℃ for 4 min. PCR reactions using other suppliers' PCR Master Mixes were performed according to each suppliers' protocol.

Lane M: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)
Lane 1: 2 kb fragment (human tumor protein p53 gene)
Lane 2: 3 kb fragment (human tumor protein p53 gene)
Lane 3: 4.5 kb fragment (human DNA cross-link repair 1A gene)
Lane 4: 8 kb fragment (human hemoglobin epsilon 1 gene)

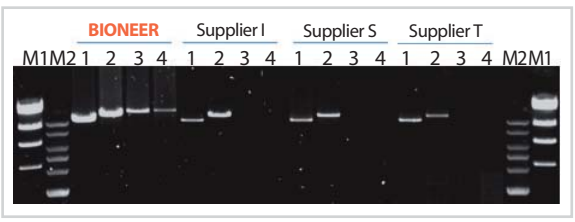


Figure 4. Comparison of PCR amplification of long targets between *AccuPower® ProFi Taq* PCR PreMix from Bioneer and other suppliers' PCR Master Mixes

The cycling conditions for *AccuPower® ProFi Taq* PCR PreMix were 95℃ for 5 min, 32 cycles of 95℃ for 20 sec and 68℃ for 15 min. PCR reactions using other suppliers' PCR Master Mixes were performed according to each suppliers' protocol. Human genomic DNA was used as a template for PCR amplification.

Lane M 1: Lambda/*Hin*d III marker (Bioneer, Cat. No. D-1050)
Lane M2: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)
Lane 1: 11 kb fragment Lane 2: 13.5 kb fragment
Lane 3: 17.6 kb fragment Lane 4: 21.4 kb fragment

01
DNA Amplification

AccuPower® ProFi Taq PCR PreMix

Lyophilized Master Mix for DNA amplification with long range kb

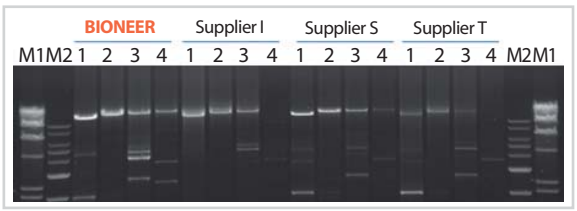


Figure 5. Comparison of PCR amplification of long targets between *AccuPower® ProFi Taq* PCR PreMix from Bioneer and other suppliers' PCR Master Mixes

The cycling conditions for *AccuPower® ProFi Taq* PCR PreMix were 95℃ for 5 min, 32 cycles of 95℃ for 20 sec, 65℃ for 40 sec, and 68℃ for 20 min. PCR reactions using other suppliers' PCR Master Mix were performed according to each suppliers' protocol. Lambda DNA was used as a template for PCR amplification.

Lane M 1: Lambda/*Hin*d III marker (Bioneer, Cat. No. D-1050)
Lane M2: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)
Lane 1: 15 kb fragment Lane 2: 20 kb fragment
Lane 3: 25 kb fragment Lane 4: 30 kb fragment

■ Ordering Information

Cat. No.	Product Description
K-2631	*AccuPower® ProFi Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached caps / 96 tubes, 20 µl reaction
K-2632	*AccuPower® ProFi Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached caps / 480 tubes, 20 µl reaction
K-2633	*AccuPower® ProFi Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached caps / 96 tubes, 50 µl reaction
K-2634	*AccuPower® ProFi Taq* PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached caps / 480 tubes, 50 µl reaction

AccuPower® Multiplex PCR PreMix

Lyophilized Master Mix for Multiplex PCR capability

■ Description

AccuPower® Multiplex PCR PreMix can simultaneously detect from one to twenty products in a single PCR reaction. It is provided in our convenient *AccuPower*® format which is a lyophilized premix that contains everything you need for PCR including Enzyme, dNTPs and our special multiplex buffer. Simply add template and primers (and ddH_2O if needed) and start your PCR.
AccuPower® Multiplex PCR PreMix is ideal for genotyping analysis and qualitative and semi-quantitative gene expression analysis using cDNA template.

■ Features and Benefits

- **Multiplex PCR** : Up to 20 different target genes from human genomic DNA can be amplified in a single tube.
- **Stability** : Stable at room temperature for a month and for 2 years in a -20℃ freezer.
- **Easy-to-use** : All reaction components required for PCR including thermostable DNA polymerase and dNTPs are contained within each tube and in a lyophilized "PreMix" form. Just add template and primers and start your reaction. dNTPs, buffer and enzyme are provided.
- **Reproducibility** : Bioneer's strict quality controll production system ensures that your results will be reproducible experiment.

■ Application

- Genotyping assays
- Diagnostic assays
- RADP
- DNA and RNA chip
- cDNA library

■ Specifications

- 5' to 3' exonuclease activity: No
- 3' to 5' exonuclease activity: No
- 3′ – A overhang: Yes
- Fragment size: ~ 1 kb

■ Storage Temperature

-20℃.

■ Experimental Data

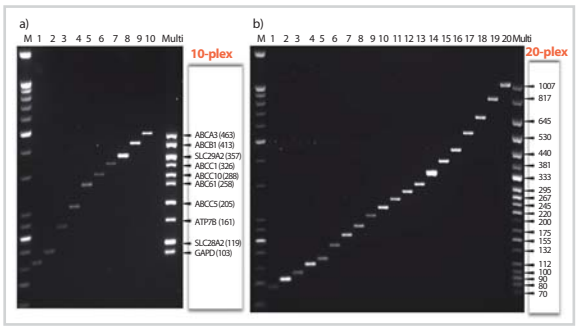


Figure 1. Single PCR and Multiplex PCR using *AccuPower*® Multiplex PCR PreMix

Each lane from left to right indicates the single and Multiplex PCR product using *AccuPower*® Multiplex PCR PreMix.
a) 10-plex PCR, b) 20-plex PCR
M; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

01
DNA Amplification

AccuPower® Multiplex PCR PreMix

Lyophilized Master Mix for Multiplex PCR capability

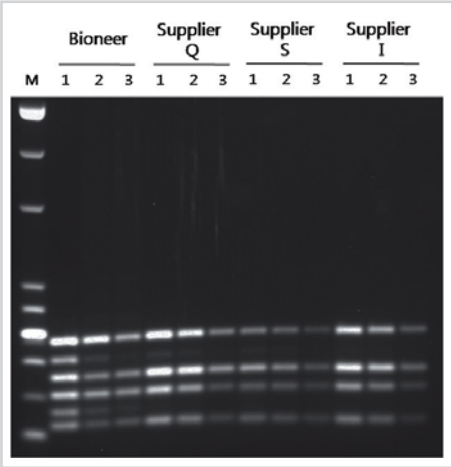


Figure 2. Comparison of amplification quality between *AccuPower*® Multiplex PCR PreMix and other suppliers' Multiplex PCR Kits.

Primers for 6-plex PCR reactions were added into *AccuPower*® Multiplex PCR PreMix and other suppliers' Multiplex PCR kits. A series of human genomic DNA diluents were tested. (Lane 1. Human genomic DNA 100ng, Lane 2. Human genomic DNA 10 ng, Lane 3. Human genomic DNA 1 ng). All data were obtained by using *MyGenie*™ 96 Gradient Thermal Block (Bioneer, Cat. No. A-2040-1).
Supplier Q: Q company Multiplex PCR Kit
Supplier S: S company Multiplex PCR Kit
Supplier I: I company *Taq* polymerase for Multiplex PCR (0.5 U, added 2 mM $MgCl_2$)
Rxn. Condition: 95℃ for 10 min, followed by 35 cycles of 30 sec at 95℃, 30 sec at 60℃, 60 sec at 72℃.
M; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

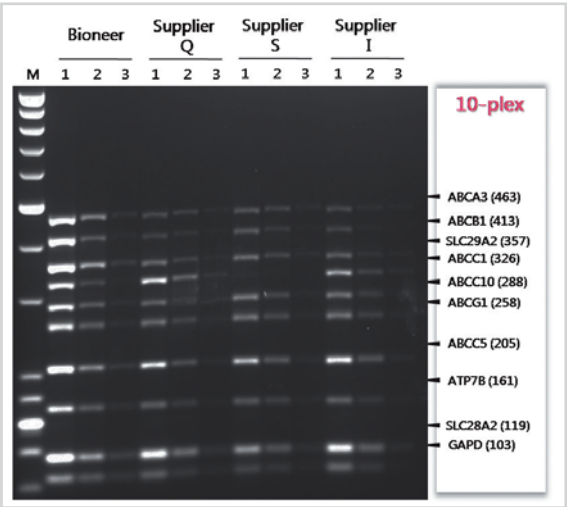


Figure 3. Comparison of amplification quality between *AccuPower*® Multiplex PCR PreMix and other suppliers ' Multiplex PCR Kits.

10-plex primers were added into *AccuPower*® Multiplex PCR PreMix and other suppliers' Multiplex PCR kits. A series of Human genomic DNA diluents were tested. (Lane 1. Human genomic DNA 100 ng, Lane 2. Human genomic DNA 10 ng, Lane 3. Human genomic DNA 1 ng). All data were obtained by using *MyGenie*™ 96 Gradient Thermal Block (Bioneer, Cat. No. A-2040-1).
Supplier Q: Q company Multiplex PCR Kit
Supplier S: S company Multiplex PCR Kit
Supplier I: I company *Taq polymerase* for Multiplex PCR (0.5 U, added 2 mM $MgCl_2$)
Rxn. Condition: 95℃ for 10 min, followed by 35 cycles of 30 sec at 95℃, 30 sec at 65℃, 60 sec at 72℃.
M; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

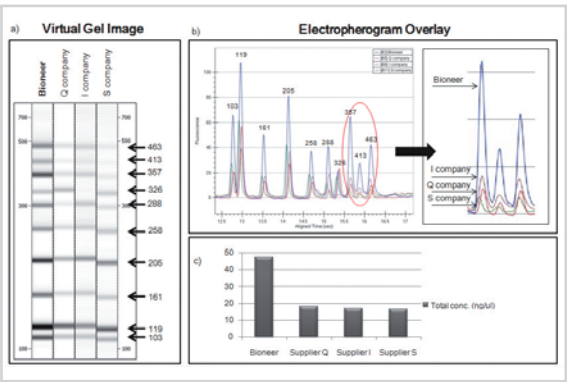


Figure 4. Comparison of amplification quality using Labchip® between *AccuPower*® Multiplex PCR PreMix and other suppliers' multiplex PCR Kits.

a) Virtual Gel Image. Gel image illustrates data reproducibility of the LabChip® 90 system.
b) Overlay of expression level using Bioneer' s Multiplex PCR PreMix and other companies' multiplex PCR kits. The electropherogram displays the data between 10 PCR products yield using 10-plex primer sets to illustrate the amplification efficiency.
c) The graph shows the total concentration of PCR products between *AccuPower*® Multiplex PCR PreMix and other suppliers' multiplex PCR Kits.

AccuPower® Multiplex PCR PreMix

Lyophilized Master Mix for Multiplex PCR capability

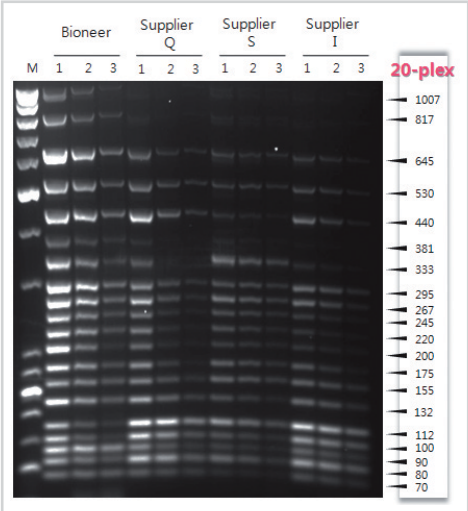


Figure 5. Comparison of amplification quality between *AccuPower*® Multiplex PCR PreMix and other suppliers' multiplex PCR Kits.

20-plex primers were added into *AccuPower*® Multiplex PCR PreMix and other suppliers' Multiplex PCR kits. A series of Human genomic DNA diluents were tested (100 ng~1 ng). All data were obtained by using *MyGenie*™ 96 Gradient Thermal Block (Bioneer, Cat. No. A-2040-1).
Supplier Q: Q company multiplex PCR Kit
Supplier S: S company multiplex PCR Kit
Supplier I: I company *Taq* polymerase for multiplex PCR (0.5 U, added 2 mM $MgCl_2$)
Rxn. Condition: 95℃ for 10 min, followed by 35 cycles of 30 sec at 95℃, 30 sec at 57℃, 60 sec at 72℃
M; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

■ Ordering Information

Cat. No.	Product Description
K-2111	*AccuPower*® Multiplex PCR PreMix, 0.2 ml thin-wall tubes with attached cap / 96 tubes, 20 µl reaction
K-2112	*AccuPower*® Multiplex PCR PreMix, 0.2 ml thin-wall tubes with attached cap / 96 tubes, 50 µl reaction
K-2113	*AccuPower*® Multiplex PCR PreMix, 0.2 ml thin-wall tubes with attached cap / 480 tubes, 20 µl reaction
K- 2114	*AccuPower*® Multiplex PCR PreMix, 0.2 ml thin-wall tubes with attached cap / 480 tubes, 50 µl reaction

01 DNA Amplification

AccuPower® Gold Multiplex PCR PreMix

Lyophilized Master Mix for high specificity DNA amplification with Multiplex PCR capability

■ Description

AccuPower® Gold Multiplex PCR PreMix can amplify up to 20 target genes in a single tube. *AccuPower*® Gold Multiplex PCR PreMix contains Bioneer's unique enzyme-mediated HotStart technology with Pyrophosphatase (PPase) and Pyrophosphate (PPi) for efficient suppression of non-specific products and enhanced amplification specificity.

AccuPower® Gold Multiplex PCR PreMix can be used for a variety of applications including genotyping assays or molecular diagnostics, and can also be used for cDNA-based semi-quantitative assays.

■ Features and Benefits

- **Flexibility** : Up to 20 different target genes from human genomic DNA can be amplified in a single tube.
- **Specificity** : PPi has high affinity for Mg^{2+} by adding PPi to the reaction mixture, the Mg^{2+} ions necessary for normal PCR is bound thus preventing DNA polymerase activity. This PPi-Mg^{2+} binding prevents non-specific before PCR (zero-cycle) product formation. Upon thermal cycling, the PPase is also added to the mixture is activated (>70℃) and hydrolyzes the PPi to 2 phosphate groups and facilitates the release of Mg^{2+}, which is then available for DNA polymerase to use and resume normal activity.
- **Easy-to-use** : All reaction components including thermostable DNA polymerase and dNTPs required for PCR, are contained within each tube and in a lyophilized "PreMix" form. The user needs only to add template DNA, primers and water to perform up to 20-plex PCR. Materials necessary for agarose gel electrophoresis are also added in the reaction.
- **Reproducibility** : Each batch is produced under strict quality controls. Errors that commonly occur during mass production are eliminated during the individual packaging process. Bioneer's current batch processing system allows for the production of more accurate and reproducible end-product yield.

■ Application

Target	Application
Human and Animal	STR analysis for determining genetic profiles in forensic cases
	Molecular diagnostic analysis
	Genotyping assay
	Qualitative and semi-qualitative gene expression assay
	Mutant screening
	Transgenic organism analysis
Plant	STR analysis
	Detection of pathogens/bacteria infection
	Transgenic organism analysis
	Qualitative and semi-qualitative gene expression assay

■ Specifications

- 5' to 3' exonuclease activity: No
- 3' to 5' exonuclease activity: No
- 3' – A overhang: Yes
- Fragment size: ~ 1 kb

■ Storage Temperature

-20℃.

AccuPower® Gold Multiplex PCR PreMix

Lyophilized Master Mix for high specificity DNA amplification with Multiplex PCR capability

■ Experimental Data

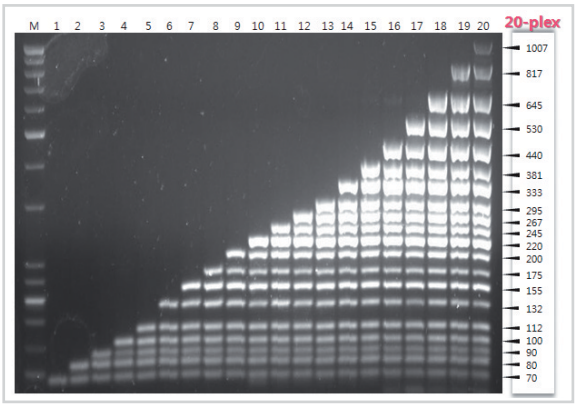


Figure 1. High specificity of *AccuPower*® Gold Multiplex PCR PreMix.
Each lane from left to right represents the progressive number of primer sets (1~20) included in *AccuPower*® Gold Multiplex PCR PreMix.
Rxn. Condition: 95°C for 10 min, followed by 30 cycles(a), 35 cycles(b) of 30 sec at 95°C, 30 sec at 57°C, 60 sec at 72°C
M; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

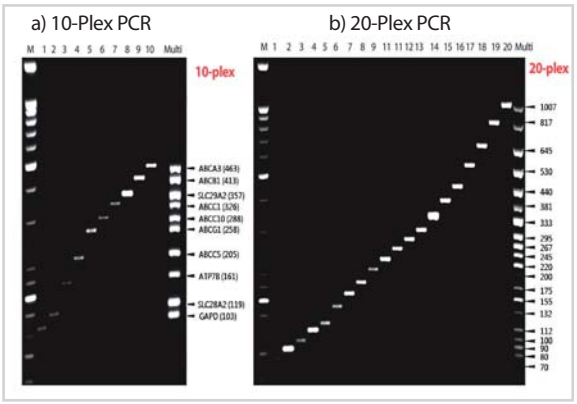


Figure 2. Single PCR and multiplex PCR using *AccuPower*® Gold Multiplex PCR PreMix
Each lane from left to right indicates the single and multiplex PCR product using *AccuPower*® Gold Multiplex PCR PreMix.
a) 10-plex multiplex PCR b) 20-plex multiplex PCR
Lane M : 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

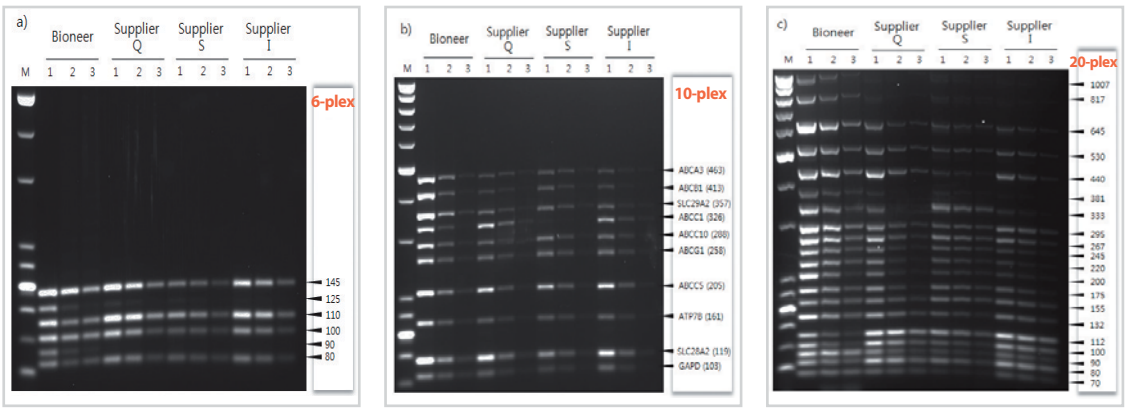


Figure 3. Comparison of amplification quality between *AccuPower*® Gold Multiplex PCR PreMix and other supplier's Multiplex PCR Kits.

6-plex (a), 10-plex (b), 20-plex(c) primers were added into *AccuPower*® Gold Multiplex PCR PreMix and other suppliers' Master Mixture. A series of human genomic DNA diluents were tested. (Lane 1: 100 ng, Lane 2: 10 ng, Lane 3: 1 ng). All data were obtained using *MyGenie*™ 96 Gradient Thermal Block (Bioneer, Cat. No. A-2040-1).
Supplier Q: Multiplex PCR Master Mix Supplier S: Multiplex PCR Master Mix
Supplier I: *Taq* polymerase for Multiplex PCR (0.5U), added 2 mM $MgCl_2$

M ; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)
Rxn. Condition: 95°C for 10 min, followed by 35 cycles of 30 sec at 95°C, 30 sec at 60°C, 60 sec at 72°C

01
DNA Amplification

AccuPower® Gold Multiplex PCR PreMix

Lyophilized Master Mix for high specificity DNA amplification with Multiplex PCR capability

■ Ordering Information

Cat. No.	Product Description
K-2115	*AccuPower* ® Gold Multiplex PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap / 96 tubes, 20 µl recreaction
K-2116	*AccuPower* ® Gold Multiplex PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap / 96 tubes, 50 µl recreaction
K-2117	*AccuPower* ® Gold Multiplex PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap / 480 tubes, 20 µl recreaction
K-2118	*AccuPower* ® Gold Multiplex PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap /480 tubes, 50 µl recreaction

02 RNA Amplification

RNA Amplification

AccuPower® RT PreMix 102

AccuPower® *CycleScript* RT PreMix 104

AccuPower® *RocketScript*™ RT PreMix 107

AccuPower® *RocketScript*™ Cycle RT PreMix 110

AccuPower® RT-PCR PreMix 113

AccuPower® *RocketScript*™ RT-PCR PreMix 115

AccuPower® *RocketPlex*™ RT-PCR PreMix 117

02
RNA Amplification

AccuPower® RT PreMix

Lyophilized Master Mix for cDNA synthesis from total RNA

■ Description

The *AccuPower*® RT PreMix is a Master Mix for cDNA synthesis that consists of *M-MLV* Reverse Transcriptase, RNase inhibitor, dNTPs, reaction buffer, tracking dye, and patented stabilizer. The Master Mix kit is used for first strand cDNA synthesis from RNA. Downstream applications include cDNA amplification with reverse transcription PCR. All of the key components are premixed at optimal concentrations. Simply add template RNA, primers and water to starting your reaction.

■ Features and Benefits

- **Stability** : In the *AccuPower*® RT PreMix, the reaction components are premixed with a special stabilizer prior to a lyophilization step to preserve the stability of the components and the activity of the RTase during storage.
- **Simplicity** :
  - Almost of the required components for cDNA synthesis, such as *M-MLV* Reverse Transcriptase and RNase inhibitor are pre-mixed in optimal concentrations.
  - The user only adds the target RNA, primers and DEPC H_2O, and the reaction is ready to start.
  - The resulting product can be used as template for PCR using the *AccuPower*® PCR PreMix without additional purification steps.
- **Reproducibility** : *AccuPower*® RT PreMix is manufactured under the strict ISO 9001 quality control conditions to ensure reproducible PCR performance.

■ Application

- RT-PCR
- Random priming reaction
- Library construction
- Probe labeling
- mRNA 5′ end mapping by primer extension analysis
- Real-Time PCR

■ Specifications

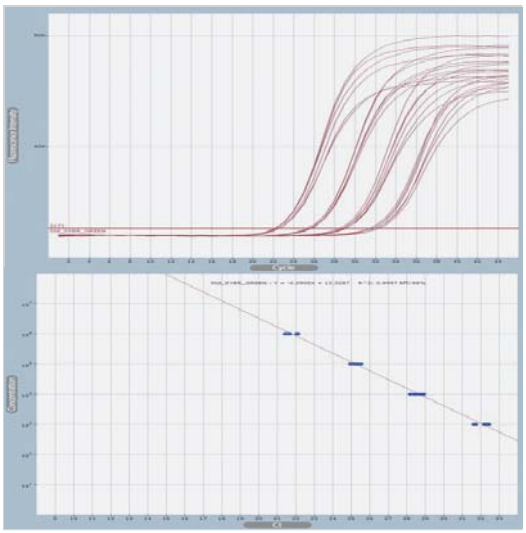
- 5' to 3' exonuclease activity : No
- 3' to 5' exonuclease activity : No
- 3′ – A overhang: No
- Fragment size: ~ 9 kb

■ Storage Temperature

-20℃.

■ Experimental data

Sensitivity & Reproducibility



Con.	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5	Batch 6
10pg	32.27	32.43	32.47	32.3	31.96	32.2
100pg	28.78	28.39	28.73	29.12	29.01	29.04
1ng	25.32	24.95	25.36	25.62	25.52	25.68
10ng	22.04	21.68	22.11	22.51	22.09	22.37

Figure 1. RT-qPCR Amplification of a GAPDH target gene using Human total RNA (from 10 ng to 10 pg) with *AccuPower*® RT PreMix.
Lanes 1-4: 10 ng, 1 ng, 100 pg, and 10pg of total RNA from HeLa cells, respectively.

AccuPower® RT PreMix

Lyophilized Master Mix for cDNA synthesis from total RNA

Specific amplification

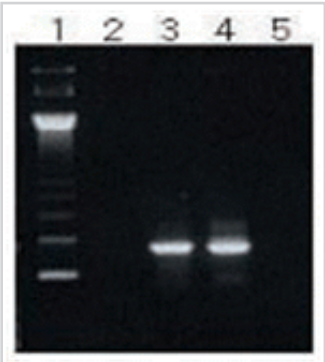


Figure 2. Specific amplification of 5'- UTR region of HCV with *AccuPower*® RT PreMix
Lane 1: DNA Ladder
Lane 2: negative control
Lane 3: HCV positive serum
Lane 4: HCV positive serum
Lane 5: HCV negative serum

Reliability and Reproducibility Test

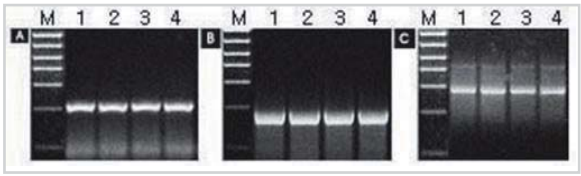


Figure 3. *AccuPower*® RT PreMix from each lot was tested to confirm reliability and reproducibility.
Human total RNA (panel A : actin, panel B : globin) and hog cholera virus RNA (panel C) were used as template. Following cDNA synthesis, *AccuPower*® PCR PreMix was used to amplify target genes.
Lane M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)
Lane 1-4: Reliability test of each lot with *AccuPower*® RT PreMix

■ Ordering Information

Cat. No.	Product Description
K-2040	*AccuPower*® RT PreMix, 0.5ml thin-wall tubes with attached cap / 100 tubes, 20 µl reaction
K-2041	*AccuPower*® RT PreMix(-dye), 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2041-B	*AccuPower*® RT PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2042	*AccuPower*® RT PreMix, 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction
K-2043	*AccuPower*® RT PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2043-B	*AccuPower*® RT PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2082-1	*AccuPower*® RT PreMix, thin-wall 384-well full-skirted plate, 5 µl reaction
K-2082-2	*AccuPower*® RT PreMix, thin-wall 384-well full-skirted plate, 10 µl reaction
K-2082-3	*AccuPower*® RT PreMix, thin-wall 384-well full-skirted plate, 20 µl reaction
K-2261-1	*AccuPower*® RT PreMix, thin-wall 96-well flat plate, 10 µl reaction
K-2261-2	*AccuPower*® RT PreMix, thin-wall 96-well full-skirted plate, 10 µl reaction
K-2261-3	*AccuPower*® RT PreMix, thin-wall 96-well semi-skirted plate, 10 µl reaction
K-2261-4	*AccuPower*® RT PreMix, thin-wall 96-well flat plate, 20 µl reaction
K-2261-5	*AccuPower*® RT PreMix, thin-wall 96-well full-skirted plate, 20 µl reaction
K-2261-6	*AccuPower*® RT PreMix, thin-wall 96-well semi-skirted plate, 20 µl reaction

02
RNA Amplification

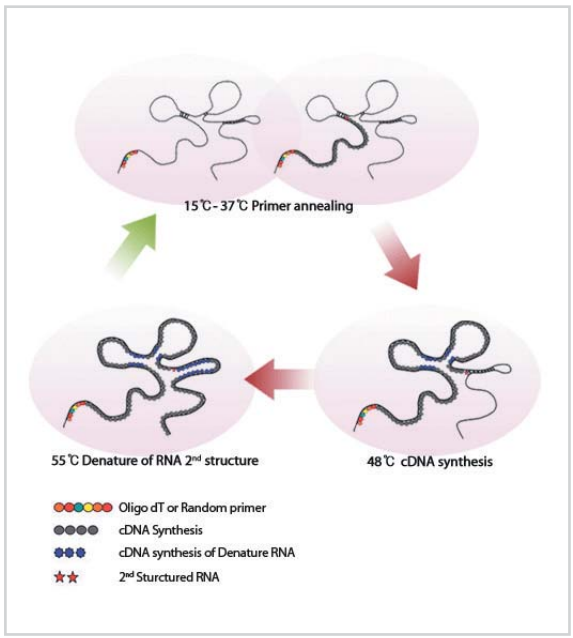
AccuPower® CycleScript RT PreMix (dT$_{20}$ & dN$_{12}$ & dN$_6$)

Lyophilized Master Mix for cDNA synthesis from total RNA at broad range of temperature

■ Description

AccuPower® CycleScript RT PreMix (available with: dT$_{20}$, dN$_{12}$, or dN$_6$ primers) is an easy-to-resuspend lyophilized PCR Master Mix of *CycleScript* Reverse Transcriptase, a primer, and all of the other components for cDNA synthesis conveniently packaged in individual tubes. Simply add template RNA, and water. Then, the reverse transcription is performed by either a Cyclic Temperature RT reaction (patent pending) or conventional reverse transcription. The use of Cyclic Temperature RT produces cDNA amplification and better results compared to conventional reverse transcription especially for rare transcripts. The resulting cDNA can be used in a variety of applications such as reverse transcription PCR (RT-PCR). The *AccuPower® CycleScript* RT PreMix series (dT$_{20}$, dN$_{12}$, or dN$_6$) is stable for 2 years at - 20℃ due to a patented stabilizer.

AccuPower® CycleScript RT PreMix was developed for both a conventional reverse transcription at a fixed temperature at 42℃ as well as Cyclic Temperature Reverse Transcription that is carried out like a PCR. Bioneer's Cyclic Temperature RT is an innovative technology to synthesize more homogeneous cDNA in less time compared to the conventional reverse transcription.



■ Features and Benefits

- **Conveniently lyophilized RT premix** : Simply add your purified RNA and start your reaction. Enzyme, dNTPs, reaction buffer, and oligo dT$_{20}$, dN$_{12}$ and dN$_6$ are provided.
- **Broad range of working temperatures** : For RNAs that are which have rich G : c contents or significant secondary structure
- **Novel Cyclic Temperature Reverse Transcription** : Ensures that you isolate even the rarest transcripts
- **High yield of cDNA** : For genes up to 9 kb within 10 minutes
- **Stable for 2 years at -20°C** : Long shelf-life
- **RNase, DNase and Proteinase-free** : Ensures the integrity of your samples

■ Application

- Sequencing of double-strand DNA or RNA
- Random priming reaction
- Library construction
- Probe labeling
- RT-PCR
- mRNA 5'-end mapping by primer extension analysis

AccuPower® *CycleScript* RT PreMix (dT$_{20}$ & dN$_{12}$ & dN$_6$)

Lyophilized Master Mix for cDNA synthesis from total RNA at broad range of temperature

Specifications

- 5' to 3' exonuclease activity: No
- 3' to 5' exonuclease activity: No
- 3′ – A overhang: No
- Fragment size: ~ 9 kb

Storage Temperature

-20℃.

Experimental data

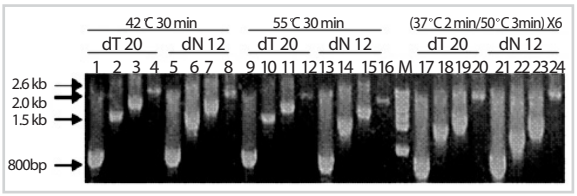


Figure 1. Reaction conditions of Cyclic Temperature Reverse Transcription (CTRT) compared with that of conventional RT.

Conventional fixed temperature RT (FTRT) reactions at 42°C and 55°C and cyclic Temperature RT reactions at 37°C and 50°C were performed using HeLa cell total RNA (800 ng each). 800 bp, 1.5 kb, 2.0 kb, and 2.6 kb fragments of human transferrin receptor gene were amplified in separate reactions. *AccuPower*® *CycleScript* RT PreMix series (dT$_{20}$ & dN$_{12}$) preferably shows good results at CTRT reaction condition.

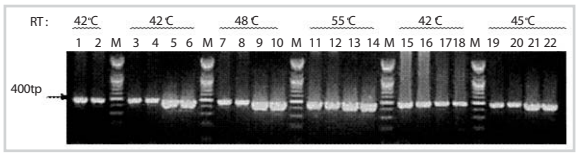


Figure 2. *AccuPower*® *CycleScript* RT PreMix series (dT$_{20}$ & dN$_{12}$) compared with other companies products for the amplification of Coxsackie virus A9 (AJ295200) 5′-UTR region.

Coxsackie virus RNA was reverse transcribed with different reverse transcription products and then amplified with PCR with *AccuPower*® PCR PreMix (Cat. No. K-2012). All materials were used in accordance with manufacturer's instructions.
Lane 1: RT product using *AccuPower*® RT PreMix and dT primer
Lane 2: RT product using *AccuPower*® RT PreMix and random primer
Lane 3, 4: *AccuPower*® *CycleScript* RT PreMix (dT$_{20}$)
Lane 5, 6: *AccuPower*® *CycleScript* RT PreMix (dN$_{12}$)
Lane 7, 8: *AccuPower*® *CycleScript* RT PreMix (dT$_{20}$)
Lane 9, 10: *AccuPower*® *CycleScript* RT PreMix (dN$_{12}$)
Lane 11, 12: *AccuPower*® *CycleScript* RT PreMix (dT$_{20}$)
Lane 13, 14: *AccuPower*® *CycleScript* RT PreMix (dN$_{12}$)
Lane 15, 16: C company's RT product with dT primer RT
Lane 17, 18: C company's RT product with random primer RT
Lane 19, 20: I company's RT product with dT primer RT
Lane 21, 22: I company's RT product with random primer RT
Lane M : 100bp DNA Ladder (Bioneer, Cat.No.D-1030)

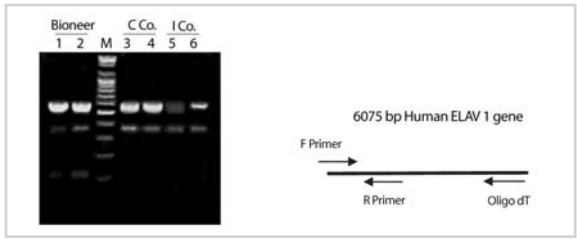


Figure 3. Long transcript production comparison of *AccuPower*® *CycleScript* RT PreMix with competitor products

Bioneer' s *AccuPower*® *CycleScript* RT PreMix 1 and 2 were incubated for 1 hr, at 55°C. C company's RT Product 3 and 4 were for 1 hr, at 42°C, I company's RT product 5 and 6 were for 1 hr, at 45°C. And then 95°C 5 min with HeLa cell total RNA. RT reaction condition was performed according to each manufacturer's recommendation. In all reactions cDNA was amplified with *AccuPower*® PCR PreMix (Cat. No. K-2012).

Lane M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)
Lane 1, 3 & 5: RT product using dT primer
Lane 2, 4 & 6: RT product using random primer

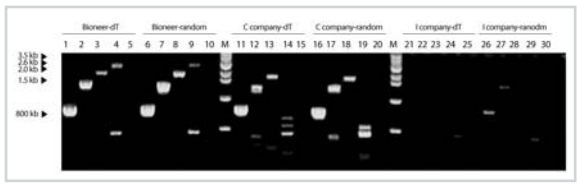


Figure 4. Gene Amplification Test using Transferrin receptor comparison of *AccuPower*® *CycleScript* RT PreMix with competitor products

The reaction condition was performed according to each manufacturer's recommendation. All cDNAs were amplified using *AccuPower*® PCR PreMix (Bioneer, Cat. No. K-2012).
Lane 1~5: *AccuPower*® *CycleScript* RT PreMix (dT$_{20}$) incubated at 55° C for 1 hr
Lane 6~10: *AccuPower*® *CycleScript* RT PreMix (dN$_{12}$) incubated at 55° C for 1 hr
Lane 11~15: C company' s RT product including dT primer incubated at 42° C for 1 hr
Lane 16~20: C company' s RT product including random primer incubated at 42° C for 1 hr
Lane 21~25: I company' s RT product including dT primer incubated at 45° C for 1 hr
Lane 26~30: I company' s RT product including random primer incubated at 45° C for 1 hr
Lane M: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)

02
RNA Amplification

AccuPower® *CycleScript* RT PreMix (dT20 & dN12 & dN6)

Lyophilized Master Mix for cDNA synthesis from total RNA at broad range of temperature

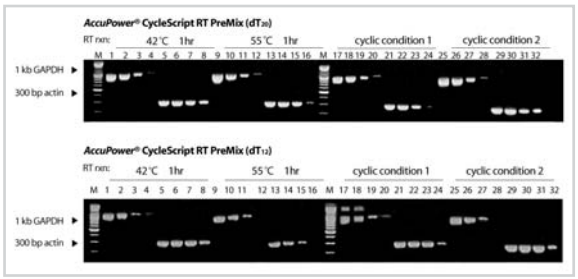


Figure 5. RT Reaction temperatures and time comparison.

Reverse transcription condition: conventional 42°C 1 hr, 55°C 1 hr. and Cyclic Temperature RT reaction 1: (37°C 2 min/50°C 3 min) X 12 cycles, Cyclic reaction 2: (37°C 1 min/ 47°C 3 min/55°C 1 min) X 12 cycles. All cDNAs were amplified using *AccuPower*® PCR PreMix (Cat. No. K-2012). *AccuPower*® *CycleScript* RT PreMix demonstrates thermal stability up to 55°C.
primer set : human GAPDH primer set human β-actin primer set
Lane M: 100bp DNA Ladder (Bioneer, Cat. No. D-1030)
Lane 1, 5, 9, 13, 17, 21, 25 & 29: HeLa cell total RNA 100 ng
Lane 2, 6, 10, 14, 18, 22, 26 & 30: HeLa cell total RNA 10 ng
Lane 3, 7, 11, 15, 19, 23, 27 & 31: HeLa cell total RNA 1 ng
Lane 4, 8, 12, 16, 20, 24, 28 & 32: HeLa cell total RNA 100 pg

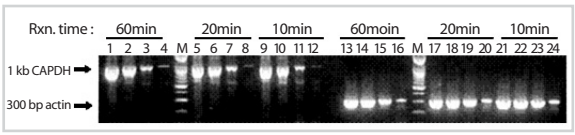


Figure 6. Reaction time comparisons.
Cyclic Temperature Reverse Transcription was performed using *AccuPower*® *CycleScript* RT PreMix (dT_{20}) as follows : (37° C 2 min/50°C 3 min) ; X12, X4, X2 cycles. All cDNAs were amplified using *AccuPower*® PCR PreMix (Cat. No. K-2012). A 10 min reaction is enough to detect the indicated genes in as little as 100 pg of genomic DNA. HeLa cell total RNA templates were serially diluted for each time frame as follows: 100 ng, 10 ng, 1 ng, and 100 pg.

■ Ordering Information

Cat. No.	Product Description
K-2044	*AccuPower*® *CycleScript* RT PreMix, dT_{20} / 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2044-B	*AccuPower*® *CycleScript* RT PreMix, dT_{20} / 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2045	*AccuPower*® *CycleScript* RT PreMix dN_{12}/ 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2045-B	*AccuPower*® *CycleScript* RT PreMix, dN_{12} / 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2046	*AccuPower*® *CycleScript* RT PreMix, dN_6 / 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2046-B	*AccuPower*® *CycleScript* RT PreMix, dN_6 / 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2047	*AccuPower*® *CycleScript* RT PreMix, dT_{20} / 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2047-B	*AccuPower*® *CycleScript* RT PreMix, dT_{20} / 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2048	*AccuPower*® *CycleScript* RT PreMix, dN_{12} / 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2048-B	*AccuPower*® *CycleScript* RT PreMix, dN_{12} / 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2049	*AccuPower*® *CycleScript* RT PreMix, dN_6 / 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2049-B	*AccuPower*® *CycleScript* RT PreMix, dN_6 / 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2050	*AccuPower*® *CycleScript* RT PreMix, dT_{20} / 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction
K-2050-1	*AccuPower*® *CycleScript* RT PreMix, dN_{12} / 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction
K-2050-2	*AccuPower*® *CycleScript* RT PreMix, dN_6 / 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction

02
RNA Amplification

AccuPower® RocketScript™ RT PreMix

Lyophilized Master Mix for cDNA synthesis including *RocketScript™ MMLV* Reverse Transcriptase thermostable up to 70°C

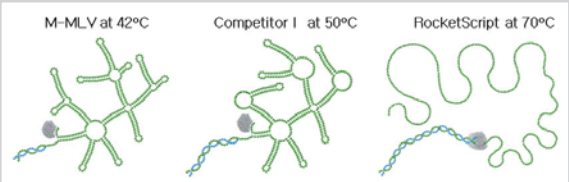
■ Description

AccuPower® RocketScript™ RT PreMix contains Bioneer's exclusive *M-MLV* based on thermostable reverse transcriptase (RTase), *RocketScript™*. Native *M-MLV* RTase has maximum activity at relatively low temperatures (42°C), causing several problems in reverse transcription of RNA molecules with complex secondary structure.

RocketScript™ has thermostable activity (42°C - 70°C), allowing efficient cDNA synthesis from virtually any RNA. The lyophilized PreMix contains all needed components for a successful reverse transcription reaction, including RTase, RNase inhibitor and buffer components. Just add template RNA, primers and water, and the RT reaction is ready to go.

Schematic representation of the 5'UTR of a gene, with complex secondary structure, at three different temperatures. Note that *RocketScript™* shows full activity at 70°C allowing it to synthesize the complete gene sequence where *M-MLV* and other Reverse Transcriptase's fail.

■ Features and Benefits



Note : Schematic representation of the 5' UTR of a gene, with complex secondary structure, at three different temperatures. Note that *RocketScript™* RTase shows full activity at 70°C allowing it to synthesize the complete gene sequence where *M-MLV* and other Reverse Transcriptase's fail.

- **Thermostable Activity** : *RocketScript™* is able to perform reverse transcription reactions throughout a wide range of temperatures between 42°C and 70°C.
- **Enhanced Performance** : *RocketScript™* has enhanced performance to handle both high and low input RNA concentrations as well as short and long RT target sizes.
- **Easy-to-use** : The product contains the enzyme itself, plus RNase inhibitors and all other components necessary for the best reverse transcription results in the tube.
- **Reproducibility** : Bioneer's strict quality controlled production system ensures that yor can have reproduciuble result.

- **Convenient** : Just add template and primers and start your reaction. dNTPs, buffer and enzyme are provided.
- **Stability** : Stable at room temperature for a month one year at 4°C and for 2 years in a -20°C freezer.
- RNase, DNase and Proteinase-free : Ensures the integrity of your samples.
- **Broad range of working temperatures** : For RNAs which have rich G : c contents significant secondary structure.
- **Stable for 2 years at -20°C** : Long shelf-life.

■ Application

- Gene synthesis
- First-strand synthesis of cDNA from RNA molecules (Reverse Transcription)
- RT-PCR
- Random priming reactions
- Library construction
- Probe labeling
- mRNA 5'-end mapping by primer extension analysis
- Real-Time PCR

■ Specifications

- 5' to 3' exonuclease: No
- 3' to 5' exonuclease: No
- 3' – A overhang: No
- Fragment size: ~ 10 kb

02
RNA Amplification

AccuPower® RocketScript™ RT PreMix

Lyophilized Master Mix for cDNA synthesis including *RocketScript™ MMLV* Reverse Transcriptase thermostable up to 70℃

■ Experimental data

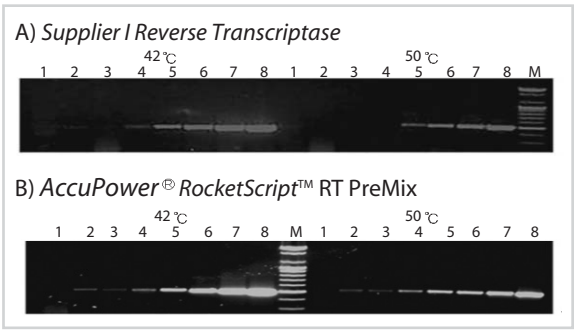
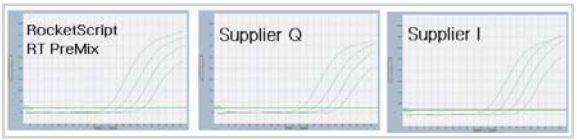


Figure 1. Sensitivity comparison between *AccuPower® RocketScript™* RT PreMix and *M-MLV* RTase

Sensitivity results of *AccuPower® RocketScript™* RT PreMix using GAPDH compared with conventional Reverse transcriptases.
Each 100 ng~10 fg of total RNA used for RT and the same amount of RT products used for electrophoresis.
Lane 1: 10 fg human total RNA from HeLa cell
Lane 2: 100 fg human total RNA from HeLa cell
Lane 3: 1 pg human total RNA from HeLa cell
Lane 4: 10 pg human total RNA from HeLa cell
Lane 5: 100 pg human total RNA from HeLa cell
Lane 6: 1 ng human total RNA from HeLa cell
Lane 7: 10 ng human total RNA from HeLa cell
Lane 8: 100 ng human total RNA from HeLa cell

Sensitivity Test



Concentration (copies/rxn)	*RocketScript* RT PreMix (Ct)	Supplier Q (Ct)	Supplier I (Ct)
10,000	23.91	25.63	24.43
1,000	27.33	28.92	28.03
100	30.62	32.42	30.88
10	33.63	35.43	33.95
Efficiency	104%	103%	108%
Linearity	0.99999	0.9996	0.9995

Figure 2. Sensitivity comparison between *AccuPower® RocketScript™* RT PreMix and other suppliers' RTases using Real-Time PCR
Reverse transcription conditions: conventional 1 hr incubation at 60℃, deactivation at 95℃ for 5 min
All cDNAs were amplified with *AccuPower® DualStar™* qPCR PreMix (Cat. No. K-6110).

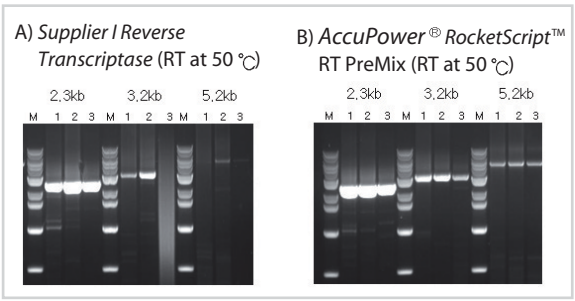


Figure 3. Comparison of amplification efficiency between *AccuPower® RocketScript™* RT PreMix and competitors' *M-MLV* RTases.

RocketScript™ is able to handle a wide range of sample concentrations and transcript lengths so your downstream applications are minimally affected by the reverse transcription step. All cDNAs were amplified using *AccuPower®* PCR PreMix (Cat. No. K-2012).
Lanes 1-3: 1,000 ng, 100 ng and 10 ng of total RNA from HeLa cells, respectively.
Note: Competitor products show inhibition at high input concentrations of total RNA.

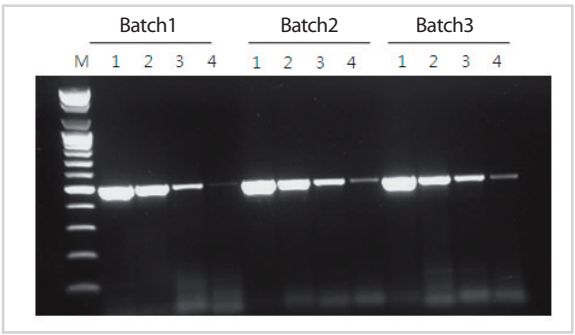


Figure 4. Highly reproducible Amplifications

Amplification of a 500 bp target gene using Human toal RNA (from 10 ng to 10 pg) with using *AccuPower® RocketScript™* RT PreMix. All cDNAs were amplified using *AccuPower®* PCR PreMix (Cat. No. K-2012).
Lanes 1-4 : 10 ng, 1 ng, 100 pg, and 10 pg of total RNA from HeLa cells, respectively.

AccuPower® *RocketScript*™ RT PreMix

Lyophilized Master Mix for cDNA synthesis including *RocketScript*™ *MMLV* Reverse Transcriptase thermostable up to 70°C

■ Ordering Information

Cat. No.	Product Description
K-2101	*AccuPower*® *RocketScript*™ RT PreMix, 20 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 96 tubes
K-2102	*AccuPower*® *RocketScript*™ RT PreMix, 20 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 480 tubes
K-2103	*AccuPower*® *RocketScript*™ RT PreMix, 50 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 96 tubes
K-2104	*AccuPower*® *RocketScript*™ RT PreMix, 50 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 480 tubes

02
RNA Amplification

AccuPower® *RocketScript*™ Cycle RT PreMix

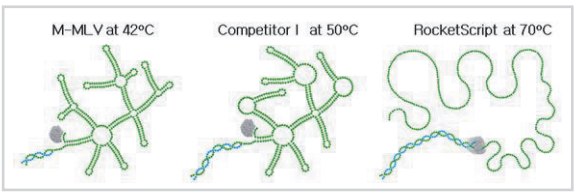
Lyophilized Master Mix for cDNA synthesis from total RNA at broadest range of temperature (up to 70℃)

■ Description

AccuPower® *RocketScript*™ Cycle RT PreMix is a ready-to-use lyophilized Master Mix containing all components for first-strand cDNA synthesis from purified Poly(A) or total RNA template.

The premix contains Bioneer's exclusive *M-MLV* based on thermostable reverse transcriptase (RTase), *RocketScript*™, and oligo dT_{20} for convenience. Conditions are optimized by Bioneer's patented Cyclic Temperature Reverse Transcription (CTRT) in a premix form.

Native *M-MLV* RTase maximizes activity at relatively low temperatures (42°C), causing several problems in reverse transcription of RNA molecules with complex secondary structure. *AccuPower*® *RocketScript*™ Cycle RT PreMix has thermostable activity across a wide temperature range, (42°C – 70°C), allowing efficient cDNA synthesis from virtually any RNA.



Note : Schematic representation of the 5' UTR of a gene, with complex secondary structure, at three different temperatures. Note that *RocketScript*™ shows full activity at 70°C allowing it to synthesize the complete gene sequence where *M-MLV* and other Reverse Transcriptase's fail.

■ Features and Benefits

- **Thermostable Activity** : *Rocketscript*™ is able to perform reverse transcription reactions throughout the wide range of temperatures between 42 and 70°C.
- **Enhanced Performance** : *Rocketscript*™ has enhanced performance to handle high and low input RNA concentrations as short and long as RT target sizes.
- **Easy-to-use** : The product contains the enzyme itself, plus RNase inhibitors and all other components necessary for the best reverse transcription results in the tubes.
- **Reproducibility** : Bioneer's strict quality control production system ensures that your results will be reproducible experiment after experiment.
- **Flexible Reaction Conditions** : Both CTRT and first-strand cDNA synthesis are possible.

The lyophilized PreMix contains all components necessary for a successful CTRT reaction, including RTase, RNase inhibitor and buffer components. Just add template RNA, primers and water, and the RT reaction is ready to go.

- **Convenient** : Just add template and primers and start your reaction. dNTPs, buffer and enzyme are provided.
- **Stability** : Stable at room temperature for a month, one year at 4°C, or for 2 years in a -20°C freezer.
- **RNase, DNase and Proteinase-free** : Ensures the integrity of your samples.
- **Broad range of working temperatures** : For RNAs which have rich G : c contents or significant secondary structure.
- **Stable for 2 years at -20°C** : Long shelf-life.

■ Application

- First-strand synthesis of cDNA from RNA molecules (Reverse Transcription)
- RT-PCR
- Random priming reactions
- Library construction
- Probe labeling
- mRNA 5'-end mapping by primer extension analysis
- Real-Time PCR

■ Specifications

- 5' to 3' exonuclease: No
- 3' to 5' exonuclease: No
- 3' – A overhang: No
- Fragment size: Up to 10 kb

AccuPower® RocketScript™ Cycle RT PreMix

Lyophilized Master Mix for cDNA synthesis from total RNA at broadest range of temperature (up to 70℃)

■ Experimental data

Thermostable Activity

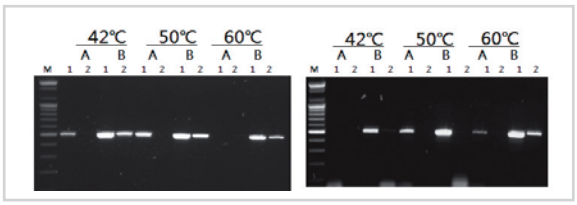


Figure 1. Complex RNA amplification results of *AccuPower*® *RocketScript*™ Cycle RT PreMix

Each target gene (MYC, TFRC) was amplified after performing reverse transcription with *AccuPower*® *RocketScript*™ Cycle RT PreMix. All cDNAs were amplified using *AccuPower*® PCR PreMix (Cat. No. K-2012).
A : *M-MLV* Reverse Transcriptase
B : *AccuPower*® *RocketScript*™ Cycle RT PreMix with Oligo (dT_{20})
Lane 1: 100 ng Human total RNA from HeLa cell
Lane 2: 10 ng Human total RNA from HeLa cell

Sensitivity & Full-length cDNA synthesis

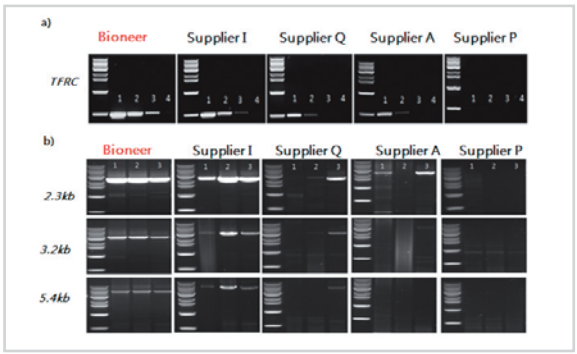
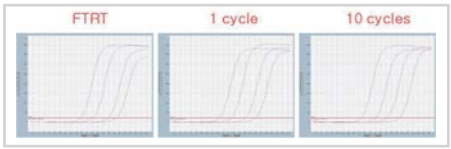


Figure 2. Comparison of amplification efficiency between *AccuPower*® *RocketScript*™ Cycle RT PreMix and competitors' RTases

(a) Sensitivity test
Primer set: Human TFRC set
Lane 1: 100 ng Human total RNA from HeLa cell
Lane 2: 10 ng Human total RNA from HeLa cell
Lane 3: 1 ng Human total RNA from HeLa cell
Lane 4: 100 pg Human total RNA from HeLa cell
Lane M: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)
RT reaction condition is performed according to each manufacturer's recommendations.
(b) Full-Length cDNA synthesis test
RT reactions were performed according to each manufacturer's recommendation. All cDNAs were amplified with *AccuPower*® *HotStart* PCR PreMix (K-5050) from Bioneer
Note: Competitor products show inhibition at high input concentrations of total RNA
Lane 1: 1 ug human total RNA from HeLa cell
Lane 2: 100 ng human total RNA from HeLa cell
Lane 3: 10 ng human total RNA from HeLa cell

Cyclic Temperature Reverse Transcription



Concentration (copies/rxn)	FTRT (Ct)	CTRT with 1 cycle (Ct)	CTRT with 10 cycles (Ct)
10,000	19.46	18.77	18.51
1,000	24.11	24.04	22.93
100	29.78	28.35	28.19
10	32.87	33.00	31.05

Figure 3. Low copy species enrichment by cycle.
Comparing FTRT (Fixed Temperature Reverse Transcription) to 1 and 10 cycle(s) of CTRT reveal progressive improvement in detected cDNA yield as input copies decrease.
FTRT: 60 min incubation at 50°C followed by 5 min deactivation at 95°C
CTRT: Cycles of 37°C annealing 10 sec, 50°C cDNA synthesis 4 min, 55°C secondary structure melting and cDNA synthesis 30 sec
Primer set: Human GAPDH
Human total RNA from HeLa cells
qPCR with *AccuPower*® *GreenStar*™ qPCR PreMix (Bioneer, Cat. No. K-6210)

Figure 4. Comparison of amplification results between Bioneer *AccuPower*® *RocketScript*™ Cycle RT PreMix and suppliers' RTases

All cDNAs were amplified with *AccuPower*® HotStart PCR PreMix (Bioneer, Cat. No. K-5050).
Primer set: Human Myc498 bp set
Lanes 1-4: 10 ng, 1 ng , and 100 pg, 10 pg of total RNA from HeLa cells, respectively
Lane M: 1 kb DNA Ladder (Bioneer, Cat. No. D-1040)

02
RNA Amplification

AccuPower® RocketScript™ Cycle RT PreMix

Lyophilized Master Mix for cDNA synthesis from total RNA at broadest range of temperature (up to 70℃)

Reproducibility

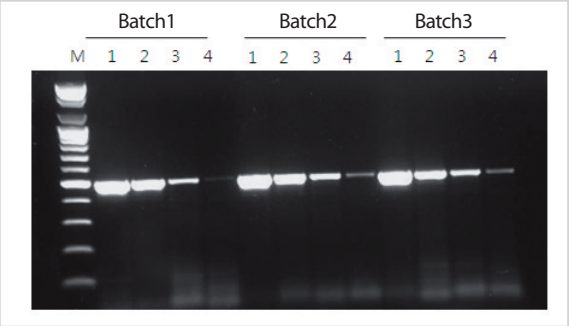


Figure 5. Highly reproducible Amplification using three different production lots of *AccuPower® RocketScript™* RT PreMix

Amplification of a 500 bp target gene was performed using Human toal RNA (diluted from 10 ng to 10 pg) with *AccuPower® RocketScript™* RT PreMix. All cDNAs were then amplified with *AccuPower®* HotStart PCR PreMix (Cat. No. K-5050).

As shown in Figure 5, highly reproducible Amplifications were achieved within each Lot.
Lanes 1-4: 10 ng, 1 ng, 100 pg, and 10 pg of total RNA from HeLa cells, respectively.

■ Ordering Information

Cat. No.	Product Description
K-2201	*AccuPower® RocketScript™* Cycle RT PreMix, 20 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 96 tubes
K-2202	*AccuPower® RocketScript™* Cycle RT PreMix, 20 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 480 tubes
K-2203	*AccuPower® RocketScript™* Cycle RT PreMix, 50 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 96 tubes
K-2204	*AccuPower® RocketScript™* Cycle RT PreMix, 50 µl, 0.2 ml thin-wall 8-strip tubes with attached cap, 480 tubes

AccuPower® RT-PCR PreMix

Lyophilized Master Mix for one step RT–PCR

■ Description

AccuPower® RT-PCR PreMix contains all needed components for sequential cDNA synthesis and amplification in one tube (one-step RT-PCR). This RT-PCR PreMix consists of *M-MLV* Reverse Transcriptase, RNA dependent DNA polymerase, and a thermostable DNA polymerase in a lyophilized mix of dNTPs, reaction buffer, RNase inhibitor, tracking dye, and stabilizer. The kit can be used for cDNA synthesis from low copy RNA or mRNA and subsequent PCR.

■ Features and Benefits

- **Convenient lyophilized RT** : Easy to use, simply add your purified RNA
- **High yield of cDNA** : For genes up to 6 kb
- **Stable for 2 years at -20°C** : Long shelf-life
- **RNase, DNase and Proteinase-free** : Ensures the integrity of your samples

■ Application

- First-strand synthesis of cDNA from RNA molecules (RT)
- RT-PCR
- Library construction
- Gene-expression analysis

■ Specifications

- 5' to 3' exonuclease: No
- 3' to 5' exonuclease: No
- 3' – A overhang: Yes
- Fragment size: ~ 6 kb

■ Experimental data

Figure 1. Specific amplification of 5'- UTR region of HCV with *AccuPower*® RT/PCR PreMix.

Lane 1: 1, 2, 3 DNA Ladder
Lane 2: negative control
Lane 3: HCV positive serum
Lane 4: HCV positive serum
Lane 5: HCV negative serum

Sensitivity

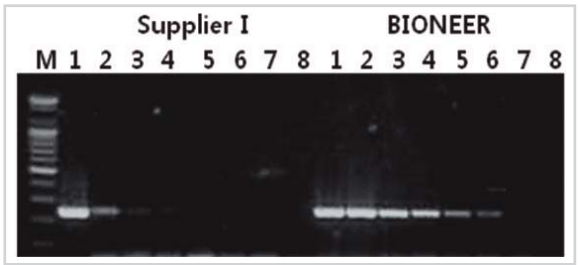


Figure 2. Sensitivity comparison between *AccuPower*® RT/PCR PreMix and Supplier I RT-PCR Kit

Serial dilutions from – 10^9 ~ 10^3 copies of Potato spindle tuber viroid (PSTVd) was used for RT-PCR and identical volumes of RT-PCR products were loaded on the gel for electrophoresis

Lane 1: 10^9 copies
Lane 2: 10^8 copies
Lane3: 10^7 copies
Lane 4: 10^6 copies
Lane 5: 10^5 copies
Lane6: 10^4 copies
Lane 7: 10^3 copies
Lane 8: NTC
Lane M: 100 bp DNA Ladder (Bioneer, Cat. No. D-1030)

02
RNA Amplification

AccuPower® RT-PCR PreMix

Lyophilized Master Mix for one step RT–PCR

Reproducibility

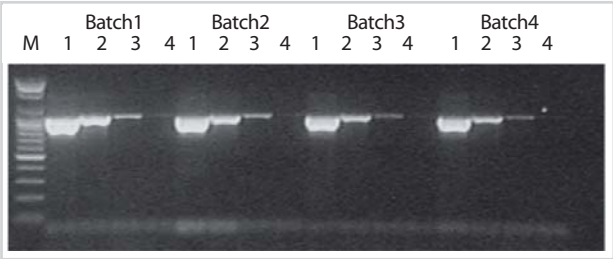


Figure 3. Reproducibility test for *AccuPower*® RT-PCR PreMix using four different production lots (batches) using serial diluted Human Total RNA.

Lane 1: 10 ng human total RNA from HeLa cell
Lane 2: 1 ng human total RNA from HeLa cell
Lane 3: 100 pg human total RNA from HeLa cell
Lane 4: 10 pg human total RNA from HeLa cell

■ Ordering Information

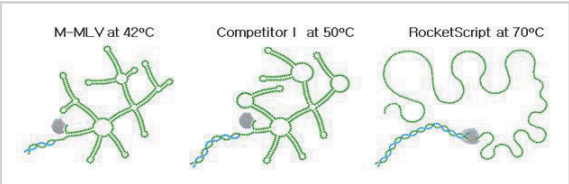
Cat. No.	Product Description
K-2055	*AccuPower*® RT/PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 20 µl reaction
K-2055-B	*AccuPower*® RT/PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 20 µl reaction
K-2056	*AccuPower*® RT/PCR PreMix, 0.5 ml thin-wall tubes with attached cap / 100 tubes, 50 µl reaction
K-2057	*AccuPower*® RT/PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 96 tubes, 50 µl reaction
K-2057-B	*AccuPower*® RT/PCR PreMix, 0.2 ml thin-wall 8-strip tubes with attached cap / 480 tubes, 50 µl reaction
K-2084-1	*AccuPower*® RT/PCR PreMix, thin-wall 384-well full-skirted plate, 5 µl reaction
K-2084-2	*AccuPower*® RT/PCR PreMix, thin-wall 384-well full-skirted plate, 10 µl reaction
K-2084-3	*AccuPower*® RT/PCR PreMix, thin-wall 384-well full-skirted plate, 20 µl reaction
K-2262-1	*AccuPower*® RT/PCR PreMix, thin-wall 96-well flat plate, 10 µl reaction
K-2262-2	*AccuPower*® RT/PCR PreMix, thin-wall 96-well full-skirted plate, 10 µl reaction
K-2262-3	*AccuPower*® RT/PCR PreMix, thin-wall 96-well semi-skirted plate, 10 µl reaction
K-2262-4	*AccuPower*® RT/PCR PreMix, thin-wall 96-well flat plate, 20 µl reaction
K-2262-5	*AccuPower*® RT/PCR PreMix, thin-wall 96-well full-skirted plate, 20 µl reaction
K-2262-6	*AccuPower*® RT/PCR PreMix, thin-wall 96-well semi-skirted plate, 20 µl reaction

AccuPower® RocketScript™ RT-PCR PreMix

Lyophilized Master Mix for one step RT–PCR including *RocketScript™ MMLV* Reverse Transcriptase thermostable up to 70°C

Description

AccuPower® RocketScript™ RT-PCR PreMix contains Bioneer's exclusive *M-MLV* based thermostable reverse transcriptase (RTase) and *Top* DNA polymerase, dNTPs and reaction buffer components all in a single, easy to use, one-step RT-PCR product. By using *RocketScript™* RTase, full-length cDNA are efficiently synthesized from complex secondary structure RNA species. *RocketScript™* also has outstanding extension properties, allowing for highly-sensitive and high-yielding cDNA synthesis of low copy targets. The convenient lyophilized PreMix also contains tracking dye (blue and yellow) and also a density-increasing agent, allowing the user to directly place the reaction mixture in an agarose gel and perform electrophoresis.



Note : Schematic representation of the 5' UTR of a gene, with complex secondary structure, at three different temperatures. Note that *RocketScript™* shows full activity at 70°C allowing it to synthesize the complete gene sequence where *M-MLV* and other Reverse Transcriptase's fail.

Features and Benefits

- **Thermostable Activity**: Original *M-MLV* RTase maximize activity at relatively low temperatures (42°C), causing several problems in reverse transcription of complex secondary structure RNA molecules. To solve this issue, Bioneer has developed a RTase activity at high temperatures (over 50°C). *RocketScript™* has thermostable activity (42°C ~ 70°C), allowing efficient cDNA synthesis from complex secondary structure RNA and give the user freedom to optimize the reverse transcription reaction based on temperature.
- **Ease-of-Use**

- The product contains our thermostable RTase *RocketScript™*, RNase inhibitors and all other components necessary for a successful RT reaction in a single tube. Just add RNA, primers and PCR-grade water to perform the RT reaction.

- Components necessary for agarose gel electrophoresis are also contained within the product including tracking dye and a density-increasing reagent for convenience.
- T vector cloning is possible without any additional reactions.

- **Reproducibility**: Each product batch is produced under strict quality control processes for accurate and reproducible results.

Application

- Low copy transcript detection
- Long RT-PCR
- RNA virus detection
- Gene-expression analysis
- First-strand synthesis of cDNA from RNA molecules (RT)
- RT-PCR
- Library construction

Specifications

- 5' to 3' exonuclease : No
- 3' to 5' exonuclease : No
- 3' – A overhang : Yes
- Fragment size : Up to 6 kb

02
RNA Amplification

AccuPower® RocketScript™ RT-PCR PreMix

Lyophilized Master Mix for one step RT–PCR including *RocketScript™ MMLV* Reverse Transcriptase thermostable up to 70°C

■ Experimental data

Figure 1. Performance comparison between *AccuPower® RocketScript™* RT-PCR PreMix and competitor RT-PCR Kits

Amplification of RNA species with complex secondary structure using *RocketScript™* is outstanding compared to the leading competitor's reverse transcriptase. RT reactions were performed according to each manufacturer's recommendations.
Lanes 1-4 are 10 ng, 1 ng, 0.1 ng and 0.01 ng of total RNA from HeLa cells, respectively

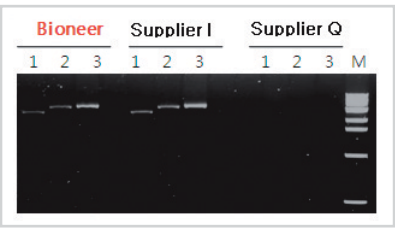


Figure 2. *AccuPower® RocketScript™* RT-PCR PreMix shows enhanced performance compared to competitors

One-Step RT-PCR reactions were performed with 100ng total RNA from HeLa cells using regents and conditions specified in each manufacturer's protocol.

Lane 1: CDC 2.3 kb Lane 2: MCM 3.2 kb Lane 3: TFRC 5.4 kb
RT reaction condition is performed according to each manufacturer's recommendations.

Reproducibility

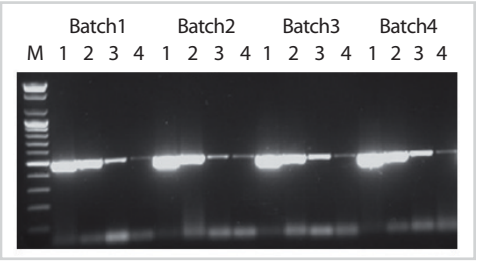


Figure 3. Highly reproducible Amplification using four different lots of *AccuPower® RocketScript™* RT-PCR PreMix

Amplification of 500 bp target gene was detected using Human total RNA (from 10 ng to 10 pg) with *AccuPower® RocketScript™* RT-PCR PreMix.
As shown in figure 3, highly RT-PCR PreMix. As shown in Figure 3, highly reproducible Amplifications were achieved between each Lot. using a dilution series.
Lanes 1-4: 10 ng, 1 ng, 100 pg, and 10 pg of total RNA from HeLa cells, respectively.

■ Ordering Information

Cat. No.	Product Description
K-2501	*AccuPower® RocketScript™* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/96 tubes 20 µl/Rxn
K-2503	*AccuPower® RocketScript™* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/96 tubes 50 µl/Rxn
K-2502	*AccuPower® RocketScript™* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/480 tubes 20 µl/Rxn
K-2504	*AccuPower® RocketScript™* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/480 tubes, 50 µl/Rxn

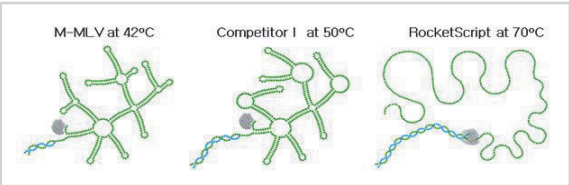
AccuPower® *RocketPlex* RT-PCR PreMix

Lyophilized Master Mix for one step Multiplex RT–PCR including *RocketScript*™ *MMLV* Reverse Transcriptase thermostable up to 70°C

■ Description

AccuPower® *RocketPlex* RT-PCR PreMix is a new product that is in a class by itself. with this Kit, thermostable Reverse transcripition which is the best technology is available, while giving you multiplex capabilities in the subsequent PCR. By combining Multiplex RT-PCR with *RocketScript*™ reverse transcriptase, you can amplify from 1 to more than 10 target genes.

AccuPower® *RocketPlex* RT-PCR PreMix contains all needed components for sequential cDNA synthesis and amplification of multiple targets in one tube (one-step RT-PCR). The RT-PCR PreMix consists of both *RocketScript*™ Reverse Transcriptase, an RNA dependent DNA polymerase, and a thermostable DNA polymerase in a lyophilized mix of dNTPs, reaction buffer, RNase inhibitor, Loading dye and stabilizer.



Note : Schematic representation of the 5' UTR of a gene, with complex secondary structure, at three different temperatures. Note that *RocketScript*™ RTase shows full activity at 70°C allowing it to synthesize the complete gene sequence where *M-MLV* and other Reverse Transcriptase's fail.

■ Features and Benefits

- **Capacity** : Detect 1-10 target genes in a single tube directly from total RNA
- **Thermostable Activity** : Thermostable reverse transcription activity (up to 70°C) lets you blast through secondary Structure
- **Specificity** : by using enzyme-mediated HotStart, PCR is highly specific.
- **High efficiency and sensitivity** : Detect every gene, every time!
- **Easy-to-use** : Simply add RNA, Primer and distilled water to begin. All other reaction components are included.
- **Reproducibility** : Bioneer's strict quality controlled production system ensures that your results will be reproducible experiment after experiment.

■ Application

- Multiplex RT-PCR
- Low copy detection
- Gene-expression analysis

■ Specifications

- 5' to 3' exonuclease: No
- 3' to 5' exonuclease: No
- 3' – A overhang: Yes
- Fragment size: ~ 1 kb

■ Experimental data

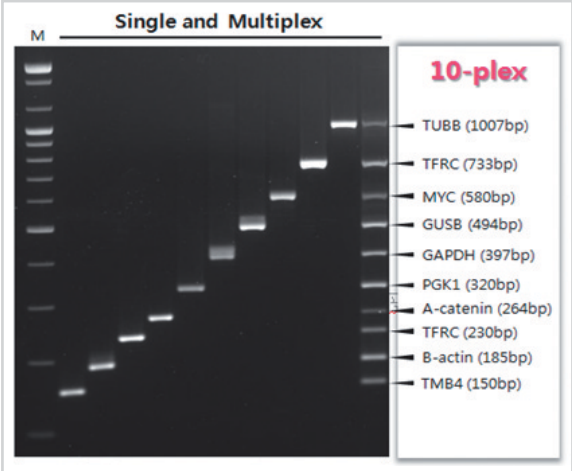


Figure 1. Single RT-PCR and multiplex RT-PCR using *AccuPower*® *RocketPlex* RT-PCR PreMix

M; 25/100 bp Mixed DNA Ladder (Bioneer, Cat. No. D-1020)

02
RNA Amplification

AccuPower® RocketPlex RT-PCR PreMix

Lyophilized Master Mix for one step Multiplex RT–PCR including *RocketScript™ MMLV* Reverse Transcriptase thermostable up to 70°C

Figure 2. Comparison of amplification quality between *AccuPower® RocketPlex* PCR PreMix and other suppliers' Multiplex PCR Kit at different temperatures for a 10-plex experiment

10-plex primers were added into *AccuPower® RocketPlex* RT-PCR PreMix and other suppliers' RT-PCR Kit. A series of Human total RNA diluents were tested. (Lane 1: Human total RNA 100 ng, Lane 2: Human total RNA 10 ng, Lane 3: Human total RNA 1 ng). All data were obtained using *MyGenie™* 96 Gradient Thermal Block (Cat. No. A-2040-1).

AccuPower® RocketPlex RT-PCR PreMix is able to perform reverse transcription reactions throughout a wide range of temperatures between 42°C and 70°C. Other supplies' kits show amplicon bias and failure at higher temperatures.

AccuPower® *RocketPlex* RT-PCR PreMix

Lyophilized Master Mix for one step Multiplex RT–PCR including *RocketScript*™ *MMLV* Reverse Transcriptase thermostable up to 70°C

■ Ordering Information

Cat. No.	Product Description
K-2211	*AccuPower*® *RocketPlex* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/96 tubes, 20 µl/rxn
K-2212	*AccuPower*® *RocketPlex* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/480 tubes, 20 µl/rxn
K-2213	*AccuPower*® *RocketPlex* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/96 tubes, 50 µl/rxn
K-2214	*AccuPower*® *RocketPlex* RT-PCR PreMix, 0.2 ml thin-wall 8-Strip tubes with attached cap/480 tubes, 50 µl/rxn

03 Real-Time qPCR and RT-qPCR

Real-Time qPCR and RT-qPCR

AccuPower® *DualStar*™qPCR PreMix ····· 121

AccuPower® Plus *DualStar*™qPCR PreMix ····· 123

AccuPower® *GreenStar*™ qPCR PreMix ····· 125

AccuPower® 2X *GreenStar*™ qPCR Master Mix ····· 128

AccuPower® *Rocket Script*™ RT-qPCR PreMix ····· 131

AccuPower® DualStar™ qPCR PreMix

The Real-Time PCR reagents for the sequence-specific probe-based detection

Description

AccuPower® *DualStar*™ qPCR PreMix is a lyophilized PCR Master Mix containing a thermostable DNA polymerase, thermostable pyrophosphatase, reaction buffer, dNTPs and patented stabilizer in a ready to use HotStart qPCR Master Mix.

AccuPower® *DualStar*™ qPCR PreMix eliminates nonspecific amplification, while providing high sensitivity, due to our novel prized HotStart methodology. Bioneer uses a unique enzyme-mediated HotStart PCR that provides robust and reproducible results. *Taq* DNA polymerase is inhibited at lower temperatures (< 70°C) by pyrophosphate. However, *Taq* is rendered fully active at temperatures over 70°C via pyrophosphate hydrolysis with our thermostable pyrophosphatase. This technology, a Bioneer exclusive, prevents the formation of mis-primed products and primer-dimers during the reaction set up process resulting in improved PCR specificity. It is ideal that nucleic acid amplification reactions involving complex genomic or cDNA templates, very low copy targets, and multiplex reactions.

Features and Benefits

- **Convenience**: Just add template, probe and primers to your target gene.
- **Extended Stability**: Stable at room temperature for a month and for 2 years in a -20°C freezer
- **High Specificity**: Unique enzyme mediated HotStart results in greater specificity and more robust reactions.
- **Reproducibility**: Each batch is produced under strict ISO quality controls.
- **Compatibility**: Optimized for most Real-Time PCR instruments.
- **Universal**: Excellent results regardless of your target gene.

Application

- Gene expression profiling
- Target DNA quantification
- Microbial detection
- Viral/bacterial pathogen load determination
- Evaluation of primer pair performance for probe-based Real-Time PCR

Specifications

- 5' to 3' exonuclease: Yes
- 3' to 5' exonuclease: No
- 3' – A overhang: Yes

Experimental data

Sensitivity and Detection range

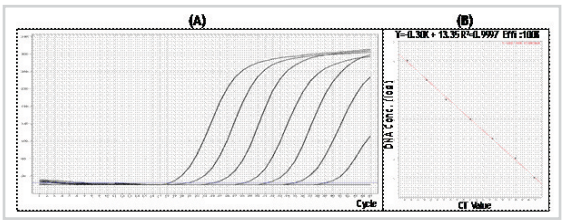


Figure 1. Real-Time PCR Data of *AccuPower*® *DualStar*™ qPCR PreMix

AccuPower® *DualStar*™ qPCR PreMix provides at least 7 orders of magnitude in dynamic range (10^7 ~ 10^1 copies/reaction).
A: Amplification curve. West Nile Virus (WNV) primers and *TaqMan*® -based probe were added into *AccuPower*® *DualStar*™ qPCR PreMix. A series of WNV positive control diluents were tested.
B: Standard curve. All data were obtained using *Exicycler*™ 96 Real-Time Quantitative Thermal Block (Bioneer, Cat. No. A-2060).

03
Real-Time qPCR and RT-qPCR

AccuPower® DualStar™ qPCR PreMix

The Real-Time PCR reagents for the sequence-specific probe-based detection

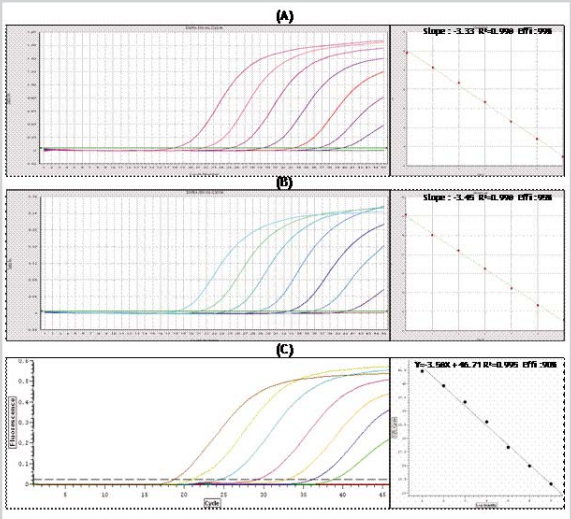


Figure 2. Data using various kinds of Real-Time PCR Instruments

AccuPower® DualStar™ qPCR PreMix is applicable to most of commercially available Real-Time quantitative PCR instruments. West Nile Virus (WNV) primers and *TaqMan®*-based probe were added into *AccuPower® DualStar™* qPCR PreMix. A series of WNV positive control diluents were tested.
A : Amplification curve and standard curve using ABI 7500 Fast Real-time PCR machine (Applied Biosystems Co.).
B : Amplification curve and standard curve using ABI 7500 Real-time PCR machine (Applied Biosystems Co.).
C : Amplification curve and standard curve using Opticon Real-Time PCR machine (MJ Research, currently Bio-Rad Inc.).

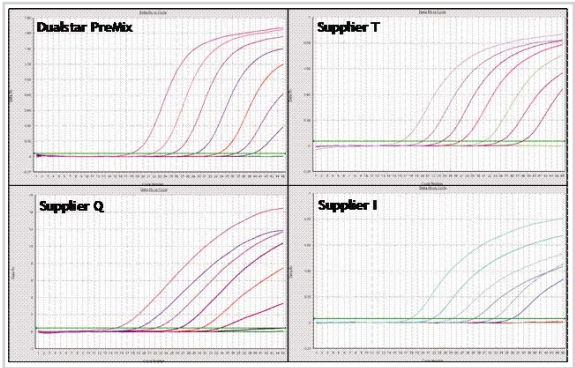


Figure 3. Comparison of detection sensitivity between *AccuPower® DualStar™* qPCR PreMix and other supplier's Master Mixture

West Nile Virus (WNV) primers and *TaqMan®*-based probe were added into *AccuPower® DualStar™* qPCR PreMix and other supplier's Master Mixture. A series of WNV positive control diluents were tested. Reaction mixtures were prepared and qPCR was performed according to each supplier's protocol. All data were obtained using ABI 7500 Fast Real-Time PCR machine (Applied Biosystems co.).

■ Ordering Information

Cat. No.	Product Description
K-6100	*AccuPower® DualStar™* qPCR PreMix, *Exicycler™* 96, 8-well strip, 20 µl, 12 strips, optical film included
K-6101	*AccuPower® DualStar™* qPCR PreMix, ABI 7500 8-well strip, 20 µl, 12 strips, optical film included
K-6102	*AccuPower® DualStar™* qPCR PreMix, 20 µl, 12 strips, Opticon 8-well strip
K-6103	*AccuPower® DualStar™* qPCR PreMix, *Exicycler™* 96, 96-well plate, 20 µl, 1 plate, optical film included
K-6104	*AccuPower® DualStar™* qPCR PreMix, ABI 7500 96-well plate, 20 µl, 1 plate, optical film included
K-6110	*AccuPower® DualStar™* qPCR PreMix, *Exicycler™* 96, 8-well strip, 50 µl, 12 strips, optical film included
K-6111	*AccuPower® DualStar™* qPCR PreMix, ABI 7500 8-well strip, 50 µl, 12 strips, optical film included
K-6112	*AccuPower® DualStar™* qPCR PreMix, 50 µl, 12 strips, Opticon 8-well strip
K-6113	*AccuPower® DualStar™* qPCR PreMix, *Exicycler™* 96, 96-well plate, 50 µl, 1 plate, optical film included
K-6114	*AccuPower® DualStar™* qPCR PreMix, ABI 7500 96-well plate, 50 µl, 1 plate, optical film included

AccuPower® Plus *DualStar*™ qPCR PreMix, 2X Master Mix

The Real-Time PCR reagents with HotStart capability for the sequence-specific probe-based detection

Description

AccuPower® Plus *DualStar*™ qPCR PreMix quickly provides exceptional data from your samples. *AccuPower*® plus products are available as 2 formats: our *AccuPower*® lyophilized PreMix format as well as a liquid 2X Master Mix format for your convenience. Both products require only the addition of your Primers, probe and template to begin your qPCR.

AccuPower® Plus *DualStar*™ qPCR PreMix goes a step further by providing resistance to common inhibitors of PCR (Blood-EDTA, Hemoglobin, Humic Acid from various sources, etc.) providing you with robust and reliable results, even with poor quality samples. *Dualstar*™ plus has been tested for resistance against many common inhibifors of PCR, s

Features and Benefits

- **User Convenience** : Just add template and primers and start your PCR. dNTPs, buffer and enzyme are provided.
- **Dynamic Range** : *AccuPower*® Plus *DualStar*™ qPCR products have a wide dynamic range: from 10^1 to 10^8 copies.
- **Specificity** : Unique enzyme mediated HotStart results in greater specificity and more robust reactions.
- **Universal** : Excellent results regardless of your target gene.
- **Compatibility** : Optimized for most Real-Time PCR instruments.
- **Reproducibility** : Each batch is produced under strict ISO 9001 quality controls.

Application

- Gene expression profiling
- Target DNA quantification
- Microbial detection
- Viral/bacterial pathogen load determination
- Evaluation of primer pair performance for probe-based Real-Time PCR

Specifications

- 5' to 3' exonuclease activity: Yes
- 3' to 5' exonuclease activity: No
- 3' – A Overhang: Yes

Storage Temperature

-20℃ .

Experimental data

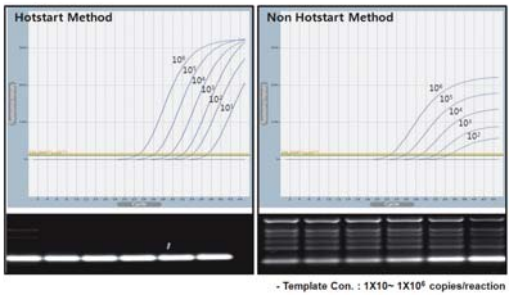
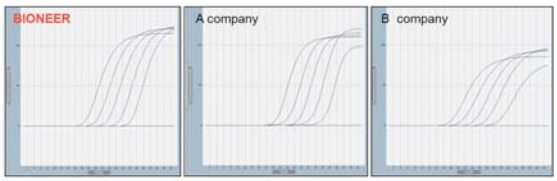


Figure 1. High specificity of *AccuPower*® Plus *DualStar*™ qPCR PreMix



C (t) Value

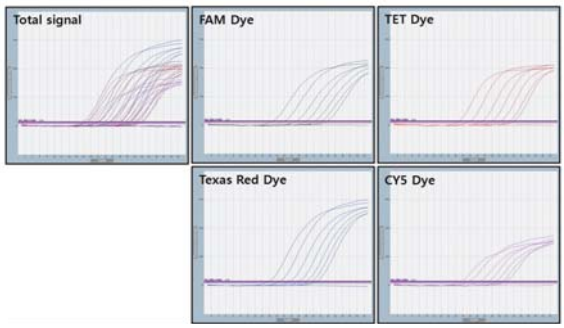
Template DNA copies	BIONEER	A Company	B Company
1,000	32.6	34.72	31.28
10,000	29.18	31.31	27.75
100,000	25.66	27.61	24.44
1,000,000	22.43	24.48	21.04
10,000,000	19.22	20.98	17.99
Efficienctlinearity	99%/1	96%/1	100%/0.9999

Figure 2. Comparison of amplification quality between *AccuPower*® Plus *DualStar*™ qPCR PreMix and other suppliers' Real-Time qPCR Kit.

03
Real-Time qPCR and RT-qPCR

AccuPower® Plus *DualStar*™ qPCR PreMix, 2X Master Mix

The Real-Time PCR reagents with HotStart capability for the sequence-specific probe-based detection



Dey	T emplate DNA of copies							
	1.00E+07	1.00E+06	1.00E+05	1.00E+04	1.00E+03	1.00E+02	1.00E+01	NTC
FAM	19.47	22.74	25.97	28.58	31.07	32.87	34.35	UD
TET	19.38	22.59	25.89	28.62	31.06	33.37	34.6	UD
TEXAS_RED	18.47	21.48	24.23	26.78	28.68	30.15	31.49	UD
CY5	20.38	22.56	25.43	27.71	29.71	31.38	32.45	UD

Figure 3. Multiplexing on four-targets with the *Exicycler*™ instrument using *AccuPower*® Plus *DualStar*™ qPCR PreMix

This figure shows amplification of a 4-target multiplex assay. The dyes used were FAM, TET, Texas Red and CY5, respectively.

The data demonstrate that over a dilution series of input template, the *AccuPower*® Plus *DualStar*™ qPCR PreMix can successfully generate up to 4-target multiplex data on the *Exicycler*™.

PCR Inhibitor		BIONEER	A Company	B Company
		Totally inhibition (PPM)		
Humic acid	Soil	10,000	*	1,000
	Peat	10,000	10,000	10,000
	Neonardite	10,000	10,000	10,000
	Fulvic	10,000	10,000	10,000
Blood-EDTA		10,000	1,000	10,000
Hemoglobin		*	*	*

* : No inhibition

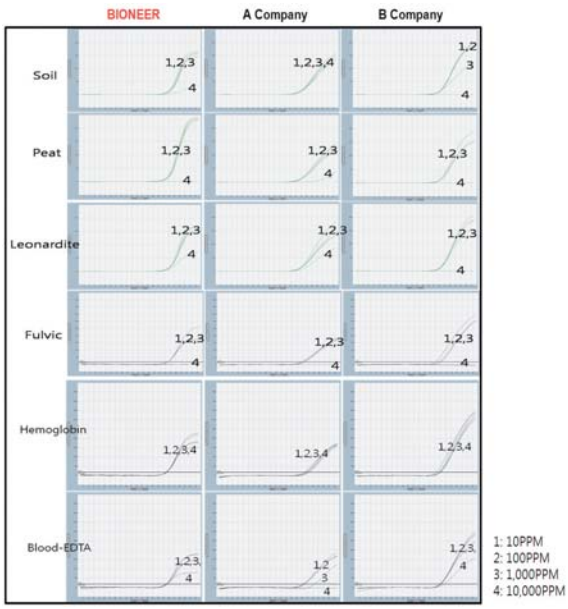


Figure 4. PCR inhibitor study using *AccuPower*® Plus *DualStar*™ qPCR PreMix compared with competitor qPCR Master Mixes

■ Ordering Information

Cat. No.	Product Description
K-6600	*AccuPower*® Plus *DualStar*™ qPCR PreMix, *Exicycler*™ 96-well plate, 50 µl, optical film included
K-6601	*AccuPower*® Plus *DualStar*™ qPCR PreMix, ABI7500 96-well plate, 50 µl, optical film included
K-6602	*AccuPower*® Plus *DualStar*™ qPCR PreMix, 50 µl, 12 strips, Opticon 8-well strip, optical film included
K-6603	*AccuPower*® Plus *DualStar*™ qPCR Master Mix, 3ml, 100 rxn

AccuPower® GreenStar™ qPCR PreMix

The Real-Time PCR reagents for the SYBR® Green-based detection

Description

AccuPower® GreenStar™ qPCR PreMix is an all-in-one PreMix containing a lyophilized combination of all the necessary components for SYBR green based Real-time PCR reactions. The mixture includes SYBR Green I dye, reaction buffer, dNTP, stabilizer and thermostable DNA polymerase as well as thermostable pyrophosphatase and pyrophosphate (PPi) which drives Bioneer's exclusive enzyme-mediated HotStart PCR. The stabilizer used in this product replaces H_2O on enzyme surfaces as the product is lyophilized allowing it to maintain full enzyme activity when stored up to 2 years at -20℃. *AccuPower® GreenStar™* qPCR PreMix provides reproducible results with high specificity, increased amplification efficiency and superior sensitivity.

Features and Benefits

- **Specificity** : *AccuPower® GreenStar™* qPCR PreMix provides accurate Real-Time PCR results using a unique enzyme-mediated HotStart method that use thermostable pyrophosphatase and pyrophosphate (PPi).
- **Stability** : *AccuPower® GreenStar™* qPCR PreMixes unique stabilizer maintains enzyme activity for 2 years at -20℃.
- **Easy-to-use** : *AccuPower® GreenStar™* qPCR PreMix contains everything you need for excellent and reproducible Real-Time PCR results. Simply add template and primers.
- **Reproducibility** : Each batch is produced under strict ISO quality controls for reproducible results.

Application

- Real-Time quantification of DNA and cDNA targets
- Gene expression profiling
- Microbial & viral pathogen detection

Specifications

- 5' to 3' exonuclease : Yes
- 3' to 5' exonuclease : No
- 3'– A overhang : Yes

03 Real-Time qPCR and RT-qPCR

AccuPower® GreenStar™ qPCR PreMix

The Real-Time PCR reagents for the SYBR® Green-based detection

■ Experimental data

Sensitivity and Detection range

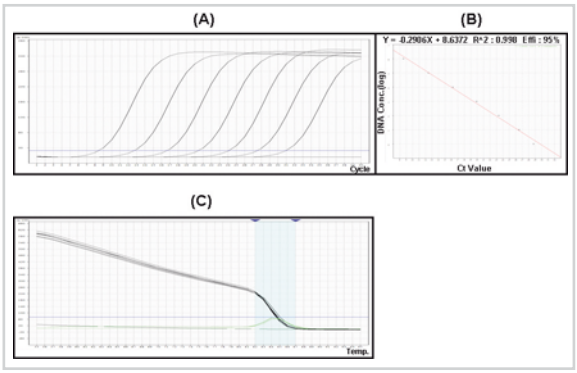


Figure 1. Real-Time PCR Data using *AccuPower® GreenStar™* qPCR PreMix

AccuPower® GreenStar™ qPCR PreMix provides at least 7 orders of magnitude in dynamic range (10 fg~10 ng /reaction).
A: Amplification curve of *AccuPower® GreenStar™* qPCR PreMix. Lambda DNA primers were added into *AccuPower® GreenStar™* qPCR PreMix. A series of lambda DNA positive control diluents were tested.
B: Standard curve of *AccuPower® GreenStar™* qPCR PreMix. - R^2 0.998, PCR efficiency - 95%
C: Melting curve analysis of *AccuPower® GreenStar™* qPCR PreMix. The melting curve shows that only single amplified PCR product was obtained in all template range.
All data were obtained using *Exicycler™* 96 Real-Time Quantitative Thermal Block (Bioneer, Cat. No. A-2060).

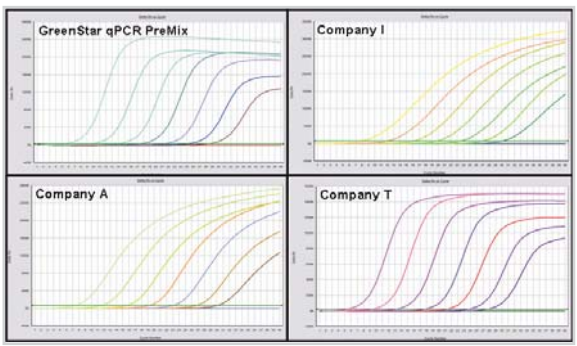


Figure 2. Comparison of amplification efficiency between *AccuPower® GreenStar™* qPCR PreMix and other company's Master Mixture

Amplification curve of *AccuPower® GreenStar™* qPCR PreMix and other company' s master-mix Kit.
Lambda DNA primers were added into *AccuPower® GreenStar™* qPCR PreMix and other company' s master-mix Kit. A series of Lambda DNA positive control diluents were tested. Reaction mixtures were prepared and qPCR was performed according to each company' s protocol.
All data were obtained using ABI 7500 Fast Real-Time PCR machine (Applied Biosystems co.).

Stability Test

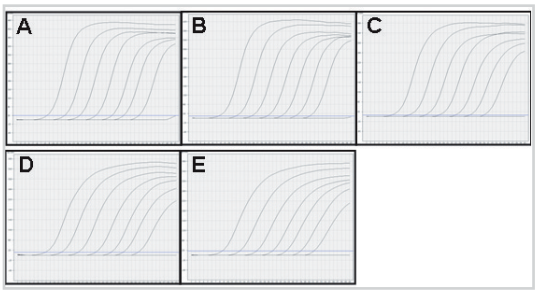


Figure 3. Stability test of *AccuPower® GreenStar™* qPCR PreMix at 50°C based on accelerated life test[1]

Amplification curve using *AccuPower® GreenStar™* qPCR PreMix after having stored at 50°C
The amplification curve shows same Ct value when used template of same concentration in all data.
A: Real-Time PCR immediately after lyophilized (positive control)
B: Real-Time PCR at 1 day at 50°C
C: Real-Time PCR at 3 days at 50°C
D: Real-Time PCR at 5 days at 50°C
E: Real-Time PCR at 6 days at 50°C
All data were obtained using *Exicycler™* 96 Real-Time Quantitative Thermal Block (Bioneer, Cat.No.A-2060).

Procedure

General reaction condition

Components	Concentration	20 ul rxn	50 ul rxn
Template	10^9 ~ 10^3 copies / rxn	5 ul	5 ul
F-primer (10pmole/ul)	Each 0.25~1um	1~2 ul	1~2 ul
R-primer (10pmole/ul)	Each 0.25~1um	1~2 ul	1~2 ul
DEPC-distilled water.	Variable	Adjust to 20 ul	Adjust to 50 ul

General reaction condition

Template DNA and primer	Conventional PCR
Template	Lambda DNA: 1 pg~100 ng
	Bacteria DNA: 100 pg~100 ng
	Human DNA: 1 ng~500 ng
Primer	5~30 pmole

AccuPower® GreenStar™ qPCR PreMix

The Real-Time PCR reagents for the SYBR® Green-based detection

■ Ordering Information

Cat. No.	Product Description
K-6200	*AccuPower® GreenStar™* qPCR PreMix, 50 µl/Rxn,12 strips, *Exicycler™*, 96, 8-well strip, optical film included
K-6201	*AccuPower® GreenStar™* qPCR PreMix, 50 µl/Rxn,12 strips, ABI 7500 8-well strip, optical film included
K-6202	*AccuPower® GreenStar™* qPCR PreMix, 50 µl/Rxn,12 strips, Opticon 8-well strip
K-6203	*AccuPower® GreenStar™* qPCR PreMix, 50 µl/Rxn, 1 plate, *Exicycler™*, 96, 96-well plate, optical film included
K-6204	*AccuPower® GreenStar™* qPCR PreMix, 50 µl/Rxn,1 plate , ABI 7500 96-well plate, optical film included
K-6210	*AccuPower® GreenStar™* qPCR PreMix, 20 µl/Rxn,12 strips, *Exicycler™*, 96, 8-well strip, optical film included
K-6211	*AccuPower® GreenStar™* qPCR PreMix, 20 µl/Rxn,12 strips, ABI 7500 8-well strip, optical film included
K-6212	*AccuPower® GreenStar™* qPCR PreMix, 20 µl/Rxn,12 strips, Opticon 8-well strip
K-6213	*AccuPower® GreenStar™* qPCR PreMix, 20 µl/Rxn, 1 plate, *Exicycler™* 96, 96-well plate, optical film included
K-6214	*AccuPower® GreenStar™* qPCR PreMix, 20 µl/Rxn,1 plate , ABI 7500 96-well plate,optical film included

03 Real-Time qPCR and RT-qPCR

AccuPower® 2X *GreenStar*™ qPCR Master Mix

The Real-Time PCR reagents for the SYBR® Green-based detection, with maximized instrument compatibility

■ Description

AccuPower® 2X *GreenStar*™ qPCR Master Mix is a ready-to-use mixture of all the necessary components for Real-Time PCR reaction based on SYBR Green. The MasterMix includes SYBR Green I dye, reaction buffer, dNTP, stabilizer and thermostable DNA polymerase as well as thermostable pyrophosphatase and pyrophosphate (PPi) which drive Bioneer's exclusive enzyme-mediated HotStart PCR. Just add template and primers to start your reaction. *AccuPower*® 2X *GreenStar*™ qPCR Master Mix provides reproducible results with high specificity, increased amplification efficiency and superior sensitivity.

■ Features and Benefits

- **High Specificity** : *AccuPower*® 2X *GreenStar*™ qPCR Master Mix provides accurate Real-Time PCR results using a unique enzyme-mediated HotStart method that use thermostable pyrophosphatase and PPi.
- **Simplicity** : Ready-to-use, *AccuPower*® 2X *GreenStar*™ qPCR Master Mix contains everything you need for excellent and reproducible Real-Time PCR results. Simply add template and primers.
- **Reproducibility** : Each batch is produced under the strict ISO quality controls for reproducible results.

■ Application

- Real-Time quantification of DNA and cDNA targets
- Gene expression profiling
- Microbial & Viral pathogen detection

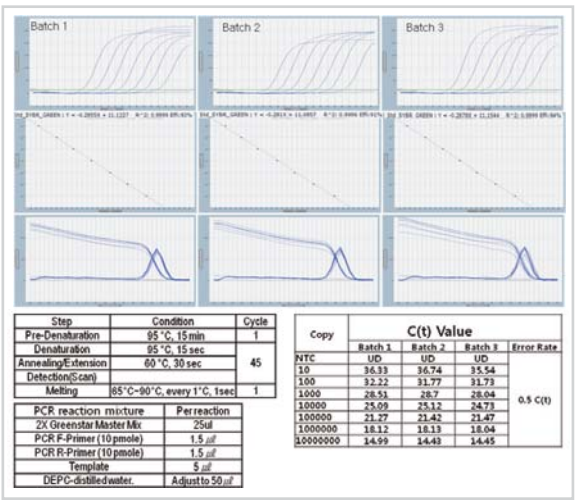
■ Specifications

- 5' to 3' exonuclease: Yes
- 3' to 5' exonuclease: No
- 3'– A overhang: Yes

AccuPower® 2X *GreenStar*™ qPCR Master Mix

The Real-Time PCR reagents for the SYBR® Green-based detection, with maximized instrument compatibility

■ Experimental data



Step	Condition	Cycle
Pre-Denaturation	95 °C, 15 min	1
Denaturation	95 °C, 15 sec	45
Annealing/Extension	60 °C, 30 sec	
Detection(Scan)		
Melting	85°C~90°C, every 1°C, 1sec	1

PCR reaction mixture	Per reaction
2X Greenstar Master Mix	25ul
PCR F-Primer (10 pmole)	1.5 ㎕
PCR R-Primer (10 pmole)	1.5 ㎕
Template	5 ㎕
DEPC-distilled water.	Adjust to 50 ㎕

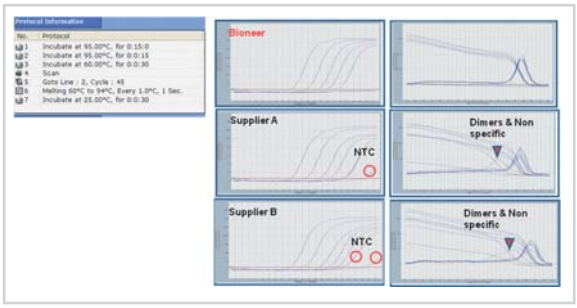
Copy	C(t) Value			
	Batch 1	Batch 2	Batch 3	Error Rate
NTC	UD	UD	UD	0.5 C(t)
10	36.33	36.74	35.54	
100	32.22	31.77	31.73	
1000	28.51	28.7	28.04	
10000	25.09	25.12	24.73	
100000	21.27	21.42	21.47	
1000000	18.12	18.13	18.04	
10000000	14.99	14.43	14.45	

Figure 1. Highly reproducible Ct values across manufacturing lots.

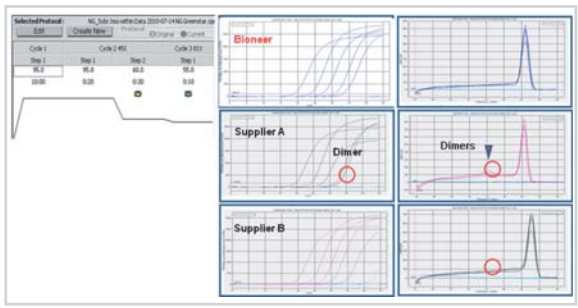
Amplification of an 90-bp target gene was detected using serially diluted LP (*Legionella Pneumoniae*) genomic DNA (from 10^6 copies to 10^1 copies) with *AccuPower*® 2X *GreenStar*™ qPCR Master Mix. As shown in figure 1, highly reproducible Ct values were achieved within each Lot. set of triplicates.

Equipment Compatibility

▷ *Exicycler*™ 96 of BIONEER



▷ Using a Bio-Rad IQ5



▷ Using a Bio-Rad IQ5

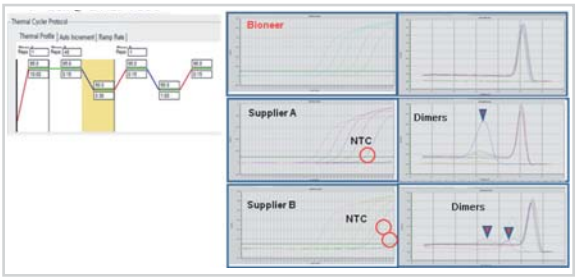


Figure 2. comparison of the specificity of the SYBR® Green assay across several instruments and competitor kits

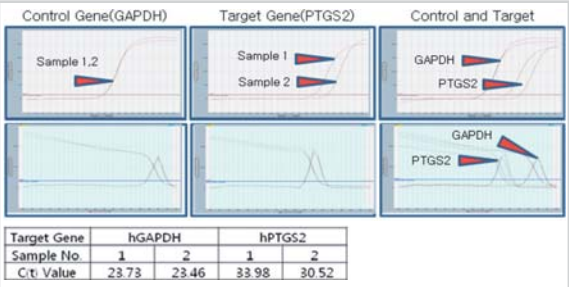
Amplification of an 90-bp target gene was detected using serially diluted LP (*Legionella Pneumoniae*) genomic DNA (10^5~10^1copies) with *AccuPower*® 2X *GreenStar*™ qPCR Master Mix. As shown in figure 2, Very small amount of primer dimers was appeared in *AccuPower*® 2X *GreenStar*™ qPCR Master Mix than other kits.

03
Real-Time qPCR and RT-qPCR

AccuPower® 2X GreenStar™ qPCR Master Mix

The Real-Time PCR reagents for the SYBR® Green-based detection, with maximized instrument compatibility

Gene Expression Analysis



Target Gene	hGAPDH		hPTGS2	
Sample No.	1	2	1	2
Ct Value	23.73	23.46	33.98	30.52

Figure 3. Gene expression analysis

Gene expression analysis was performed using primers from Bioneer's *AccuTarget*™ Validated Real-Time PCR Primer Library. cDNA was synthesized using Human PTGS2 target primers and GAPDH controls. Total RNA was isolated from HeLa cell and blood cell and cDNA was produced using *AccuPower*® *CycleScript*™ RT PreMix (K-2044, Bioneer). Gene analysis was carried out both Hela cell and blood cell by operating Real-Time PCR reaction(95°C 10 min, 1 cycle and 95°C 10 sec, 58°C 25 sec, 72°C 30 sec, 41 cycles) using the cDNA, *AccuPower*® 2X *GreenStar*™ PCR Master Mix and *Exicycler*™ 96 Real-Time Thermal Block (Bioneer, Cat. No. A-2060).

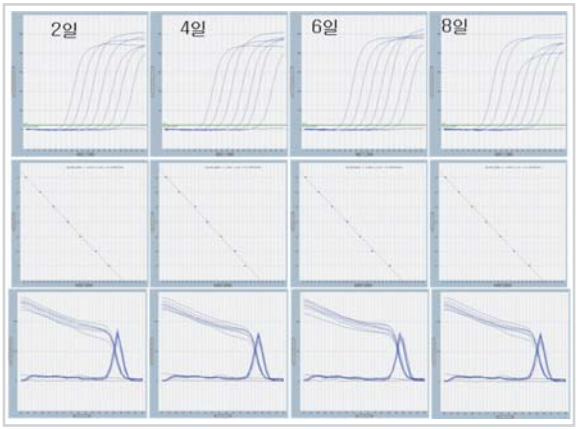


Figure 4. Stability test of *AccuPower*® 2X *GreenStar*™ qPCR Master Mix after incubation at Room Temperature for various times.

Amplification curve using *AccuPower*® 2X *GreenStar*™ qPCR PreMix after having been stored at 25°C for the indicated times.

The amplification curve shows same Ct value across all data and incubation times.

All data were obtained using *Exicycler*™ 96 Real-Time Quantitative Thermal Block (Cat.No.A-2060).

■ Ordering Information

Cat. No.	Product Description
K-6251	*AccuPower*® 2X *GreenStar*™ Master Mix Solution(50 ul/Rxn, 100 Rxn)50X ROX Dye(0.1 ml X 1ea), DEPC-D.W.(1.5 m X 1 ea)
K-6252	*AccuPower*® 2X *GreenStar*™ Master Mix Solution(50 ul/Rxn, 200 Rxn)50X ROX Dye(0.1 ml X 1ea), DEPC-D.W.(1.5 m X 1 ea)

AccuPower® *RocketScript*™ RT-qPCR PreMix, 2X Master Mix

Lyophilized Master Mix for one step RT-qPCR for the sequence-specific probe-based detection – applied a new concept of HotStart RT technology

■ Description

AccuPower® *RocketScript*™ RT-qPCR PreMix(Korea patent# : 10-2012-0024676) is new kits that improves the process of reverse transcription by applying for a HotStart method to improve sensitivity and specificity.

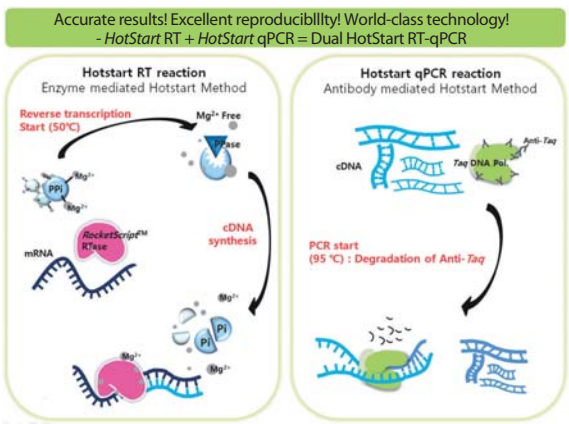
Bioneer uses a unique *Pyro*HotStart RT that provides robust and reliable results. Bioneer's *RocketScript*™ Reverse Transcriptase is inhibited at lower temperatures (< 60℃) by pyrophosphate. However, *RocketScript*™ RT is rendered and fully active at temperatures over 60℃ via pyrophosphate hydrolysis with our thermostable pyrophosphatase. This prevents the formation of mis-primed products and primer-dimers during the reaction set up process resulting in improved specificity and sensitivity for your reverse transcription reaction. It is ideal for experiments involving in complex RNA templates with very low copy targets. After the unique *Pyro*HotStart RT method, Bioneer uses a HotStart *Taq* polymerase to amplify the cDNA – all as a single-step RT-qPCR Kit.

Because of the *DualHotStart*™ provided in the kit (for both RT and PCR), *AccuPower*® *RocketScript*™ RT-qPCR PreMix provides the highest sensitivity and specificity of any RT-qPCR kit available. Furthermore, this product is ready-to-use. Simply add Template RNA, Primers and Probe and start your reaction!

AccuPower® *RocketScript*™ RT-qPCR PreMix is provided in our conveniently lyophilized format or as a 2 x Master Mix.

■ Features and Benefits

• Sensitivit



■ Application

- Gene expression profiling
- Target RNA quantification
- Microbial detection
- Viral/bacterial pathogen load determination

■ Specifications

- 5' to 3' exonuclease activity: Yes
- 3' to 5' exonuclease activity: No
- 3' – A Overhang: Yes

■ Storage Temperature

-20℃.

AccuPower® *RocketScript*™ RT-qPCR PreMix, 2X Master Mix

Lyophilized Master Mix for one step RT-qPCR for the sequence-specific probe-based detection – applied a new concept of HotStart RT technology

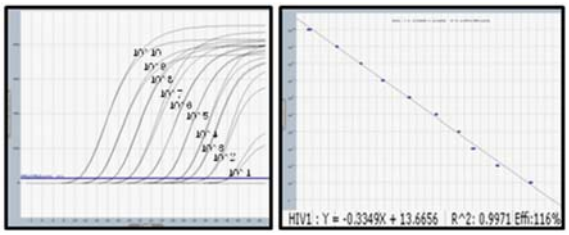


Figure 1. High sensitivity of *AccuPower*© *RocketScript*™ RT-qPCR PreMix.

Experiment with HIV target. 10 fold serial dilution of Template RNA (10^{10} copies ~ 10 copies spiked in 1 ug total RNA from from HeLa cells).

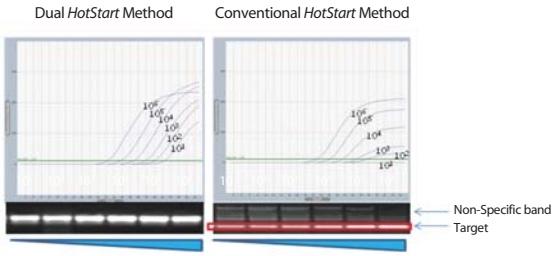
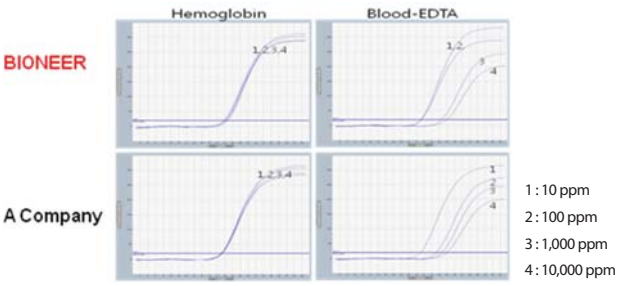


Figure 2. High specificity of *AccuPower*© *RocketScript*™ RT-qPCR PreMix.

Experiment with HCV target. 10 fold serial dilution of Template RNA (10^6 ~ 10 copies)spiked in total RNA from HeLa cells, conventional *HotStart* qPCR often generates non-specific amplification at low template concentration, which deteriorates the sensitivity of qPCR. *DualHotStart* RT-qPCR accurately amplifies target RNA without non-specific amplification, even at extremely low concentration of template.



Curve 1 : Added of PCR inhibitor 10 PPM

Curve 2 : Added of PCR inhibitor 100 PPM

Curve 3 : Added of PCR inhibitor 1,000 PPM

Curve 4 : Added of PCR inhibitor 10,000 PPM

Figure 3. PCR inhibitor (Humic acid) study using *AccuPower*© *RocketScript*™ RT-qPCR PreMix.

Human blood has the various PCR inhibitors for suppression of PCR reaction, such as hemoglobin or blood-EDTA. The effect of blocking of those agents in RT-qPCR was tested using *AccuPower*© *RocketScrip*™ RT-qPCR PreMix, when added directly to the reactions at final concentration of 10 – 10,000 PPM.

These results showed that *AccuPower*© *RocketScript*™ RT-qPCR PreMix using *DualHotStart* RT-PCR method is not effected or less by PCR inhibitor in RT-PCR reaction. *AccuPower*© *RocketScript*™ RT-qPCR PreMix is accurately detected target in the sample contained various PCR inhibitors.

Ordering Information

Cat. No.	Product Description
K-6700	*AccuPower*© *RocketScript*™ RT-qPCR PreMix, *Exicycler*™ 96, 96-well plate, 50 ul, optical film included (96 rxn)
K-6701	*AccuPower*© *RocketScript*™ RT-qPCR PreMix, ABI7500, 96-well plate, 50 ul, optical film included (96 rxn)
K-6702	*AccuPower*© *RocketScript*™ RT-qPCR PreMix, Opticon, Opticon 8-well strips, 12 strips, 50 ul, optical film included(96 rxn)
K-6703	*AccuPower*© *RocketScript*™ RT-qPCR Master Mix (2X), 100 rxn

04

Custom *AccuPower*® PCR PreMix

Custom *AccuPower*® PCR PreMix

Custom *AccuPower*® PCR PreMix 134

AccuPower® System 136

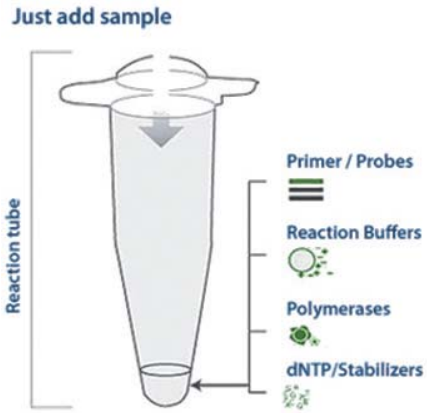
04 Custom AccuPower® PCR PreMix

Custom *AccuPower*® PCR PreMix

Experience Magical Convenience and Outstanding Reproducibility

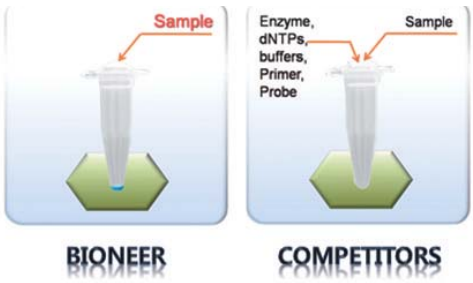
Bioneer's Custom *AccuPower*® PCR PreMix Service provides high reproducibility and convenience in use. Bioneer's *AccuPower*® PreMix technology has been developed during last 20 years.

Bioneer's Custom *AccuPower*® PCR PreMix Service provides thermostable DNA polymerase, dNTPs, reaction buffer, stabilizer thermostable PPase for HotStart PCR and cutstomer requested primer to form as a lyophilized "PreMix" in each tube. The user only needs to add template DNA/RNA and water to performing PCR.



■ Application

- Outstanding reproducibility: Large-scale batch production through automated processes and minimize user's errors through the one-step pipetting provides constant results run after run.
- Signature convenience: All components for the assay are contained within the tube. Just Add Sample!
- Industry leading stability: Lyophilization suspends reagent deterioration, leading to longest-in-class 2 years shelf-life.



Company	BIONEER	R Company
Convenience	+++ (Lyophilized)	++ (Frozen liquid type; requires mixing)
Stability	+++ (Maxium 2 year in freezer)	++ (Less than 6 months in freezer)
Cross-contamination resistance	+++	++
Automation	+++ (Simple process and instrumentation)	+

■ Ordering Information

BIONEER's Custom Amplification Service

Minimum Quantity	1960 tubes	
Production Period	Single Custom PreMix	~10 business days
	2~3-Multiplex Custom PreMix	~12 business days
	4-Multiplex Custom PreMix	~16 business days
	5-Multiplex Custom PreMix	Inquire

Custom *AccuPower*® PCR PreMix

Experience Magical Convenience and Outstanding Reproducibility

■ How to order

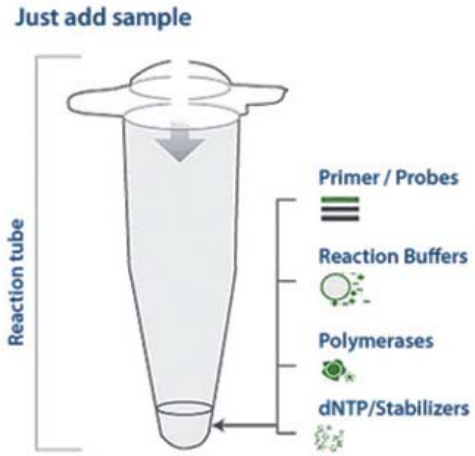
Step 1	Please send the experimental information (below) necessary for producing the custom premix to: export1@bioneer.com. Informations: Amplicon size, Oligo sequence, Additional reaction conditions (besides Bioneer's standard conditions), Order quantity and Product type (PCR, HotStart, RT-PCR etc.)
Step 2	Our AccuPower Team will respond by email with estimated waiting time and quotation based on the information you have provided.
Step 3	If you decide to go ahead with the Custom PreMix Service, let us know by email or phone. We will immediately initiate the service, starting with oligo synthesis.

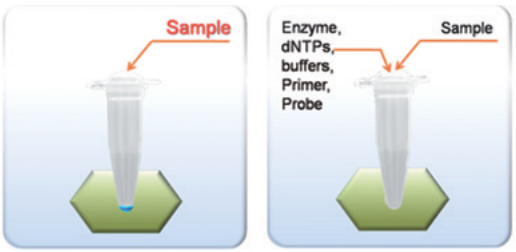
E-mail: export1@bioneer.com

04
Custom AccuPower® PCR PreMix

AccuPower® Sysyem

- Outstanding reproducibility
  Large-scale batch production through automated processes and minimize user's errors (one-step pipetting) means constant results run after run.
- Signature convenience
  All components for the assay are contained within the tube. Just Add Sample!
- Industry leading stability:
  Lyophilization suspends reagent deterioration, leading to longest-in-class 1 years shelf-life.





BIONEER COMPETITORS

Company	BIONEER	R Company
Convenience	+++ (Lyophilized)	++ (Frozen liquid type; requires mixing)
Stability	+++ (Over 1 year in freezer)	++ (Less than 6 months in freezer)
Cross-contamination resistance	+++	++
Automation	+++ (Simple process and instrumentation)	+