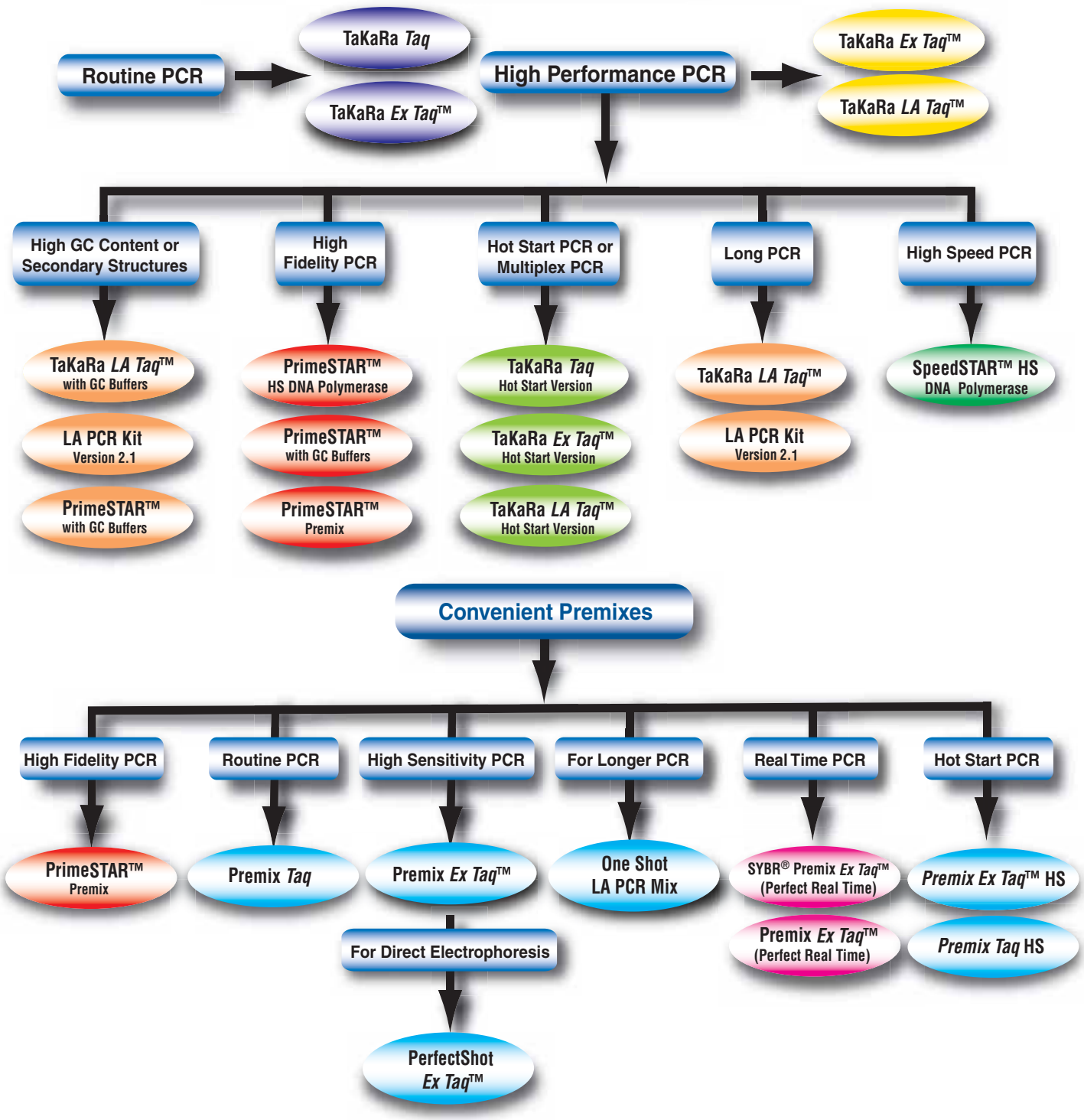
Premium PCR Enzymes

- High Fidelity PCR
- Real Time PCR
- High-Speed PCR
- Long PCR
- Routine PCR
- Multiplex PCR
- Hot-Start PCR
- GC-Rich PCR

TaKaRa

Scientifi

How to Select
The Best PCR Enzyme
for Your Application



*Hot start enzymes contain an anti-*Taq* antibody to minimize non-specific amplification

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Takara PCR Product Summary

To try one of these products, look for the FREE SAMPLE AVAILABLE *to get a free sample of the polymerase.*

HIGH FIDELITY PCR

PrimeSTAR™ HS DNA Polymerase

Features

- **Superior Accuracy**: A strong exonuclease activity results in an extremely low error rate, with only 12 of 250,000 bp containing errors as determined by DNA sequence analysis.
- **Excellent Efficiency:** High efficiency amplification - even higher than *Taq* Polymerase.
- **Robust Amplification:** Tolerance to varying reaction conditions means a single PCR cycling protocol can be used to amplify products of varying sizes.

Application(s)

- Excellent for targeted demanding cloning
- SNP detection
- High accuracy amplifications

Description

PrimeSTAR™ HS DNA Polymerase is a novel high fidelity PCR enzyme which provides maximum fidelity as well as extended product length (8.5 kb for human genomic DNA; 22 kb for λ DNA). Targeted for demanding cloning (i.e. amplification of cDNA libraries) and sequencing applications, it offers extremely high accuracy, and fidelity calculated by sequence analysis. It also offers excellent amplification efficiency and shortened reaction times. Finally, the antibody-mediated hot start formulation prevents false initiation events during reaction assembly due to mispriming or primer digestion, thus, lowering background.

Kit Components

FREE SAMPLE AVAILABLE

R010A (250 U)

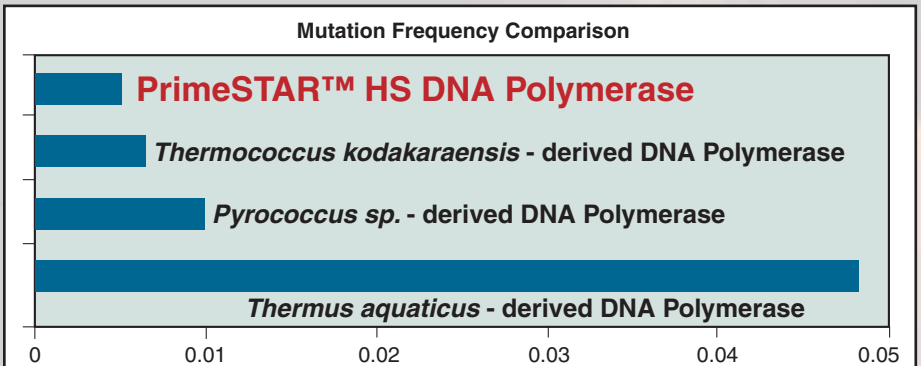
PrimeSTAR™ HS DNA polymerase	100 µL
5X PrimeSTAR™ Buffer (Mg^{2+})	2 x 1 mL
dNTP Mixture	800 µL

New! PrimeSTAR™ HS (Premix) (R040A)

PrimeSTAR™ HS DNA Premix is a convenient 2X formulation containing PrimeSTAR™ HS, PCR Buffer, $MgCl_2$, and dNTPs. The 2X premix solution of enzyme and reaction components simplifies reaction assembly, minimizes the risk of contamination, and increases reaction reproducibility. The premix, along with the added benefits of the PrimeSTAR™, has excellent efficiency and fidelity from the very strong 3'→5' exonuclease activity. In addition, the amplification efficiency is higher (>10X) than that of standard *Taq*. This formulation allows quick reaction assembly for high throughput applications with lowered risk of contamination.

New! PrimeSTAR™ HS DNA Polymerase WITH GC Buffers (R044A)

PrimeSTAR™ HS DNA Polymerase with GC Buffers was developed for high-fidelity amplification of high GC (≥75%) templates. PrimeSTAR™ HS is a unique high fidelity DNA polymerase, offering both maximal accuracy and higher amplification efficiency than *Taq* Polymerase. The new GC buffer formulation facilitates robust extension through even very high GC regions efficiently and accurately. Inclusion of a monoclonal antibody suppresses both the DNA polymerase and 3'→5' exonuclease activities prior to the first denaturing step, preventing false initiation events during reaction assembly and primer digestion. PrimeSTAR™ HS DNA Polymerase with GC buffers provides reliable amplification, high accuracy, and high specificity in applications where amplification of high-GC DNA templates for cloning or library construction is required.



Fidelity comparison with competitors' sequencing results showed only 12/249,941 mismatched bases in DNA fragments amplified using PrimeSTAR™ HS.

High Fidelity PCR Made Easy

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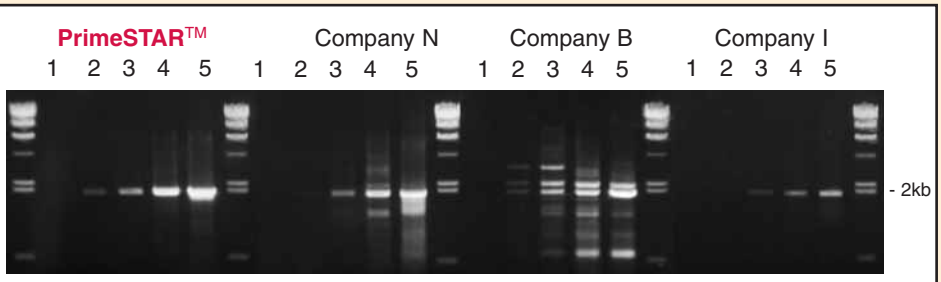
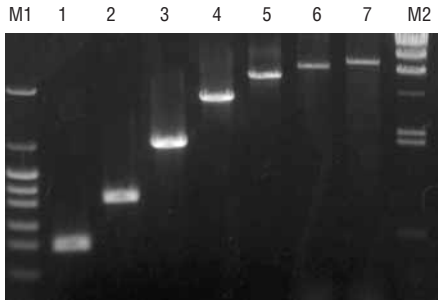
Applications: PrimeSTAR™ HS DNA Polymerase



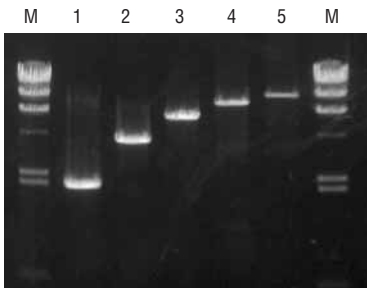
Comparison of PrimeSTAR™ HS Amplification Efficiency with Competitors on a 2 kb Human Genomic DNA Fragment. Superior amplification efficiency was apparent using PrimeSTAR™ HS on a human genomic (DCLRE1A) 2 kb template. Human genomic DNA was used in the following quantities: Lane 1: 0 ng (dH_2O), Lane 2: 100 pg, Lane 3: 1 ng, Lane 4: 10 ng, Lane 5: 100 ng.



	pHY Marker	Template	
M1:			
1:	0.5 kb	***DNA: 0.5-6 kb***	
2:	1 kb	98°C 10 sec.	30 cycles
3:	2 kb	60°C 5 sec.	
4:	4 kb	72°C 1 min./kb	
5:	6 kb	***DNA: 7.5-8.5 kb***	
6:	7.5 kb	98°C 10 sec.	30 cycles
7:	8.5 kb	68°C 8 min.	
M2:	λ-*Hin*d III digest		

Template DNA: 100 ng human genomic DNA

Amplification of Various Sized Fragments (0.5 to 8.5 kbp) using PrimeSTAR™ HS DNA Polymerase.

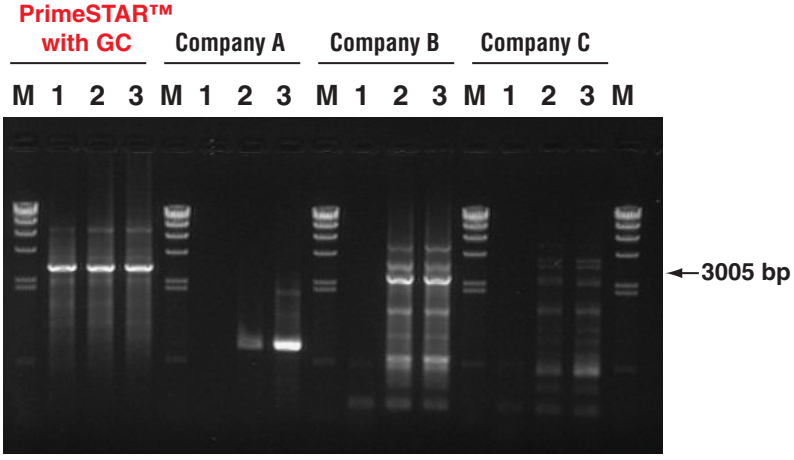


M:	λ-*Hin*d III digest	98°C 10 sec.	30 cycles
1:	2 kb	60°C 5 sec.	
2:	4 kb	72°C 1 min./kb	
3:	6 kb		
4:	8 kb		
5:	10 kb		

Template DNA: 100 pg *E. coli* genomic DNA

Amplification of Various Sized of *E. coli* Genomic DNA targets using PrimeSTAR™ HS DNA Polymerase.

Application: PrimeSTAR™ HS DNA Polymerase with GC buffers



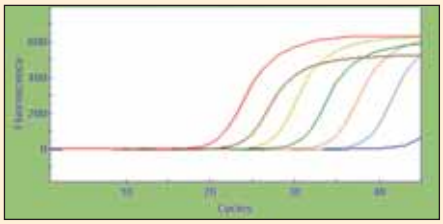
Amplification of a 3005 bp high-GC (73.2%) TthHB8 Genomic DNA Template. The performance of high fidelity, high-GC enzymes from Companies A, B, and C were compared with PrimeSTAR™ HS DNA Polymerase with GC Buffer. Lanes 1, 2, and 3: 100 pg, 1 ng, 10 ng human genomic DNA template.

REAL TIME PCR

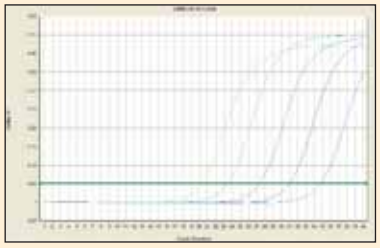
SYBR® Premix *Ex Taq*™ (Perfect Real Time)

Features

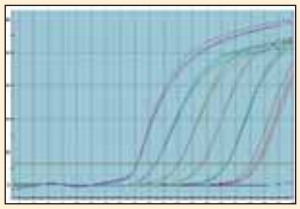
- **Versatility:** Compatible with SmartCycler®, LightCycler®, ABI 7000 & 7700, RotorGene™, Mx3000P® and other real time PCR instruments.
- **High Sensitivity:** Detects as few as 100 target copies.
- **Wide Dynamic Range:** Possesses a dynamic range of 7-8 orders of magnitude (λ DNA template).
- **Accurate Quantification:** Produces excellent standard curves using numerous real time instruments.
- **Convenient:** A separate tube of ROX reference dye is supplied.



SYBR® Premix *Ex Taq*™ (Perfect Real Time) Amplification Curve using a Smart Cycler®



SYBR® Premix *Ex Taq*™ (Perfect Real Time) Amplification Curve using a Applied Biosystems 7500 Real Time System



SYBR® Premix *Ex Taq*™ (Perfect Real Time) Amplification Curve using a MX3000P (Stratagene)

Excellent Amplification Curves Generated using SYBR® Premix *Ex Taq*™ with Several qPCR Instruments.

Application

- High sensitivity and specificity real time PCR quantitation of DNA using SYBR® Green I
- Low Ct value qPCR

Description

SYBR® Premix *Ex Taq*™ (Perfect Real Time) is a convenient (2X) premix consisting of Takara's high fidelity, high performance *Ex Taq*™ Hot Start DNA Polymerase, SYBR® Green I, and an optimized real time buffer which provides superior specificity and increased amplification efficiency for real time PCR. Antibody-mediated hot start technology prevents nonspecific amplification due to mispriming and/or formation of primer dimers during the reaction assembly. The *Taq* antibody-polymerase complex is denatured in the first cycling step, releasing the polymerase and allowing DNA synthesis to proceed.

SYBR® Premix *Ex Taq*™ (Perfect Real Time) has a dynamic range of 7-8 orders of magnitude and sensitivity to 100 copies.

Compatible cyclers when using SYBR® Premix *Ex Taq*™ (Perfect Real Time) include the SmartCycler®, Light Cycler®, ABI PRISM® 7000/7700/7900 HT, Applied Biosystems 7300/7500, iCycler®, MJ Opticon®, and the Stratagene Mx3000P®.

Additionally, two ROX reference dyes are also supplied as separate components. These serve as convenient internal reference standards for use in normalizing signals due to non-PCR related fluorescence fluctuations that occur either between wells or over time in different instruments.

SYBR® Premix *Ex Taq*™ (Perfect Real Time) provides superior specificity, performance and amplification yield for real time PCR on all major real time instruments.

Kit Components

FREE SAMPLE AVAILABLE

RR041A (200 reactions)

SYBR® Premix *Ex Taq*™ Mix (2X conc.)*	1 x 5 mL
ROX Reference Dye I (50X conc.)	200 µL
ROX Reference Dye II (50X conc.)	200 µL

*contains *Ex Taq*™ HS DNA Polymerase, dNTP mix, Mg^{2+} and SYBR® Green I

Note

The ROX Reference Dye/Dye II is supplied for performing normalization of fluorescent signal intensities within wells when used with real time PCR instruments which have this option. For ABI PRISM® 7000/7700/7900HT and Applied Biosystems 7300 Real-Time PCR Systems, the use of ROX Reference Dye (50X) is recommended. For the Applied Biosystems 7500 Real-Time PCR system, use of ROX Reference Dye II is recommended. The use of ROX Reference Dye or Dye II is optional, and not required when using Smart Cycler® and LightCycler® real time instruments.

Application: qPCR Detection Using SYBR® Green I

Comparison of Amplification Efficiency and Reaction Specificity.

Amplification efficiency and reaction specificity were compared between Takara's SYBR® Premix *Ex Taq*™ (Perfect Real Time) and three leading competitor qPCR enzymes using three major real time instruments. The results of these experiments, performed under the manufacturer's recommended conditions respectively, can be seen in the figures below.

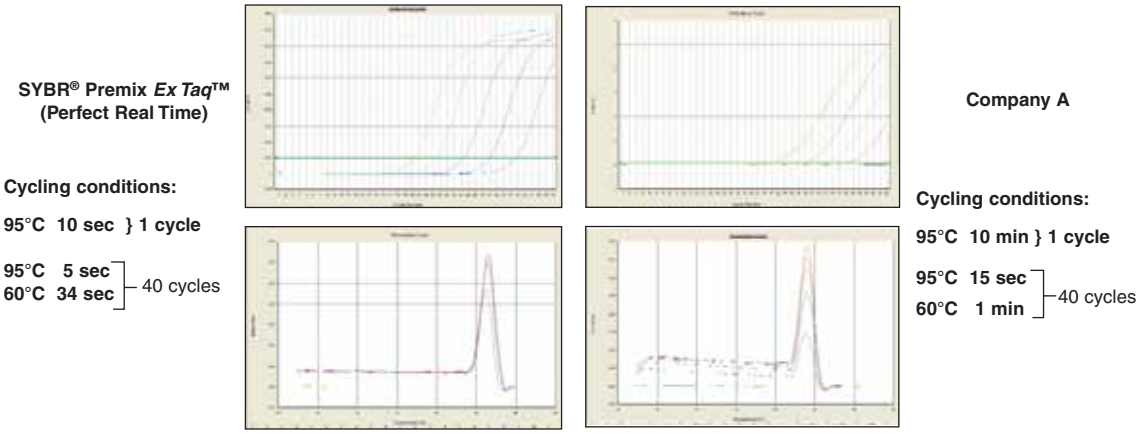


Figure 1: **Performance of SYBR® Premix *Ex Taq*™ (Perfect Real Time) vs. Company A using an Applied Biosystems 7500 Real-Time PCR System.**

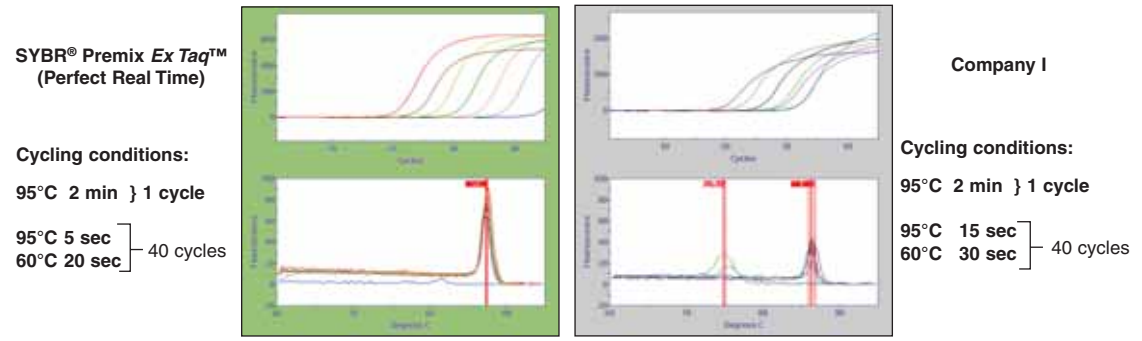


Figure 2: **Performance of SYBR® Premix *Ex Taq*™ (Perfect Real Time) vs. Company I using a Cepheid Smart Cycler®.**

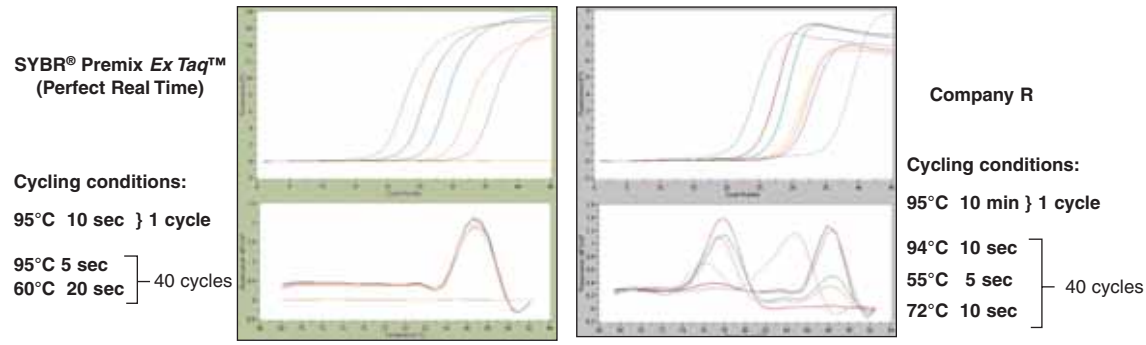


Figure 3: **Performance of SYBR® Premix *Ex Taq*™ (Perfect Real Time) vs. Company R using a Roche LightCycler®.**

REAL TIME PCR

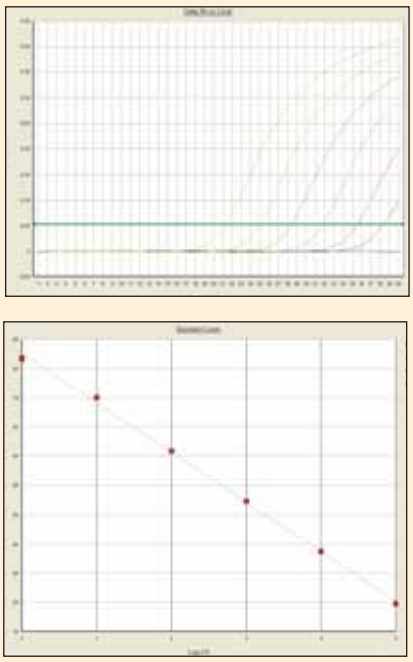
Premix *Ex Taq*™ (Perfect Real Time)

Features

- **Versatility:** Compatible with SmartCycler®, LightCycler® ABI PRISM® 7000/7700/7900 HT, Applied Biosystems 7500 Real-Time PCR Systems, Mx3000P® and other real time PCR instruments.
- **High Sensitivity:** Detects as few as 10 target copies.
- **Wide Dynamic Range:** Refer to graphs below.
- **Accurate Quantitation:** Produces excellent standard curves with numerous real time instruments.

Application(s)

- Real time PCR using either Probes or SYBR® Green I
- Fast qPCR



Amplification curve (top panel) and standard curve (bottom panel) for Premix *Ex Taq*™ (Perfect Real Time) using the TaqMan® Gene Expression Assay on the Applied Biosystems 7500 Real-Time PCR System.

Description

Premix *Ex Taq*™ (Perfect Real Time) is a 2X premix specially designed for high speed, high sensitivity real time PCR using either detection probes (e.g. TaqMan®) or SYBR® Green I (not included). It consists of Takara's high fidelity, high performance *Ex Taq*™ Hot Start DNA Polymerase, and an optimized real time buffer which provides superior specificity and increased amplification efficiency for real time PCR. Antibody-mediated hot start technology prevents non-specific amplification due to mispriming and/or formation of primer dimers during the reaction assembly. The *Taq* antibody-polymerase complex is denatured in the first cycling step, releasing the polymerase and allowing DNA synthesis to proceed.

Premix *Ex Taq*™ (Perfect Real Time) has a dynamic range of 7-8 orders of magnitude for SYBR® Green I detection and 10 orders of magnitude with probe detection, as well as sensitivity to 100 traget copies for SYBR® Green I and 10 target copies for probe detection.

Compatible cyclers include the SmartCycler®, LightCycler®, ABI PRISM® 7000/7700/ 7900 HT, Applied Biosystems 7300/7500, iCycler®, MJ Opticon®, and the Stratagene Mx3000P®.

Additionally, two tubes of ROX reference dyes are supplied as separate components. ROX dye is a convenient internal reference standard for use in normalizing signals due to non-PCR related fluorescence fluctuations that occur either between wells or over time.

Premix *Ex Taq*™ (Perfect Real Time) provides superior specificity, performance and amplification yield for real time PCR on all major real time instruments.

Kit Components

FREE SAMPLE AVAILABLE

TAK RR039A	(200 reactions)
Premix *Ex Taq*™ Mix (2X conc.)*	5 x 1 mL
ROX Reference Dye (50X conc.)	200 µL
ROX Reference Dye II (50X conc.)	200 µL

*contains *Ex Taq*™ HS DNA Polymerase, dNTP mix, Mg^{2+}

Note

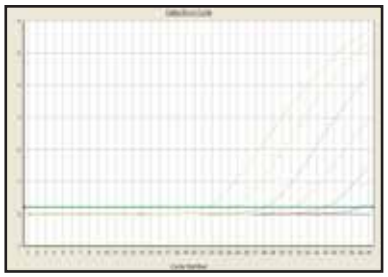
The ROX Reference Dye/Dye II is supplied for performing normalization of fluorescent signal intensities within wells when used with real time PCR instruments which have this option. For ABI PRISM® 7000/7700/7900HT and Applied Biosystems 7300 Real-Time PCR Systems, the use of ROX Reference dye (50X) is recommended. For the Applied Biosystems 7500 Real-Time PCR system, use of ROX Reference Dye II is recommended. The use of ROX Reference Dye or Dye II is optional, and not required when using Smart Cycler® and LightCycler® real time instruments.

Application: qPCR Detection Using Probe Method

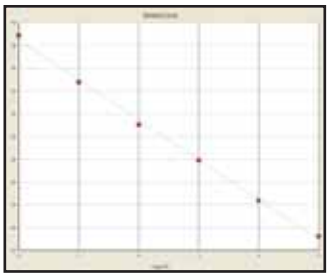
A comparison of Takara's Premix *Ex Taq*™ (Perfect Real Time) and ABI's TaqMan® Universal PCR Master Mix were performed using the Applied Biosystems 7500 Real-Time PCR System with the TaqMan® Gene Expression Assay. Two applications were performed using human ACTB and mouse GAPD as the target DNAs. A dilution series of cDNA (corresponding to total RNA 1 pg-100 ng) was performed using sterile distilled water as a negative control. Cycling conditions for all reactions are included below.

Figure 1:
Performance of Premix *Ex Taq*™ (Perfect Real Time) or TaqMan® Universal PCR Master Mix with the TaqMan® Gene Expression Assays (Applied Biosystems).

Target: Human ACTB



Amplification Curve



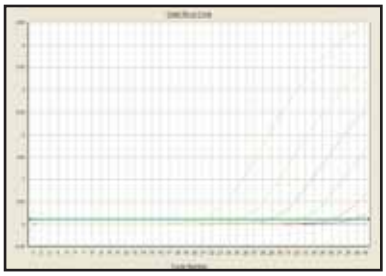
Standard Curve

Takara
Premix *Ex Taq*™

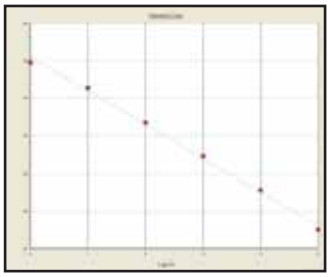
PCR conditions:

95°C 10 sec
↓
95°C 5 sec
60°C 34 sec
40 cycles

Time required: ~50 minutes



Amplification Curve



Standard Curve

Company A

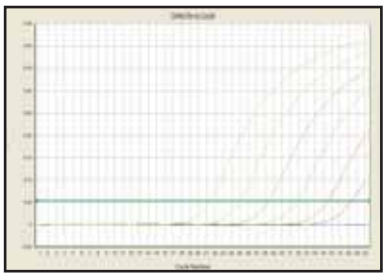
PCR conditions:

95°C 10 sec
↓
95°C 15 sec
60°C 1 minute
40 cycles

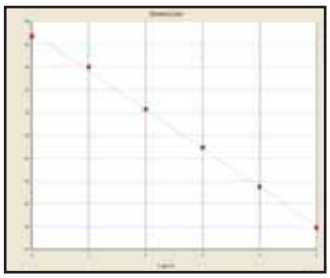
Time required: ~90 minutes

Figure 2:
Performance of Premix *Ex Taq*™ (Perfect Real Time) or TaqMan® Universal PCR Master Mix with the TaqMan® Gene Expression Assays (Applied Biosystems).

Target: Mouse GAPD



Amplification Curve



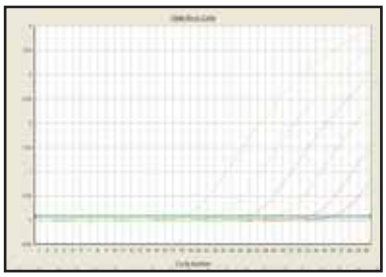
Standard Curve

Takara
Premix *Ex Taq*™

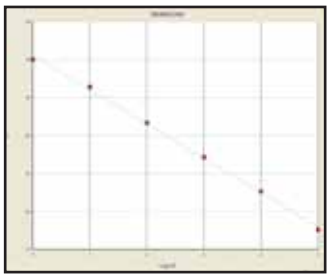
PCR conditions:

95°C 10 sec
↓
95°C 5 sec
60°C 34 sec
40 cycles

Time required: ~50 minutes



Amplification Curve



Standard Curve

Company A

PCR conditions:

95°C 10 sec
↓
95°C 15 sec
60°C 1 minute
40 cycles

Time required: ~90 minutes

HIGH SPEED PCR

SpeedSTAR™ HS DNA Polymerase

Features

- **High Speed Amplification:** Amplify a 2 kb fragment in as little as 30 minutes.
- **Excellent Efficiency:** Robust performance, comparable to high yield polymerases.
- **No Special Instrument Needed:** Cut reaction times by two-thirds without purchasing a specialized instrument.
- **Long Fragments:** Optimized two-buffer system allows amplification of fragments up to 20 kb with reduced optimization.

Application(s)

- Amplifications of long fragments in a reduced period of time
- Fast PCR on any PCR cycler
- High efficiency amplifications in 1/3 the time

Description

SpeedSTAR™ HS DNA Polymerase is a convenient, efficient DNA polymerase specially designed for fast PCR. Extension times in as short as 10 sec/kb are possible, (compared to 60 sec/kb with general enzymes), dramatically reducing total reaction times. SpeedSTAR™ reactions can be performed using standard PCR instruments, and the robust two-buffer system facilitates efficient amplification of varying size fragments (up to 20 kb) with less optimization than other polymerases. Additionally, the hot start formulation provides increased specificity and reduced background.

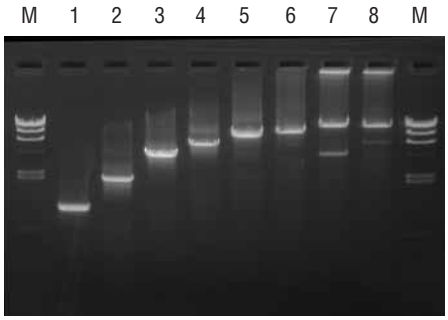
Kit Components

FREE SAMPLE AVAILABLE

RR070A (250 U)

SpeedSTAR™ HS DNA polymerase	(5 units/µl) 50 µL
10X Fast Buffer I (Mg^{2+}*)	1 mL
10X Fast Buffer II (Mg^{2+}*)	1 mL
dNTP Mixture (ea. 2.5 mM)	800 µL

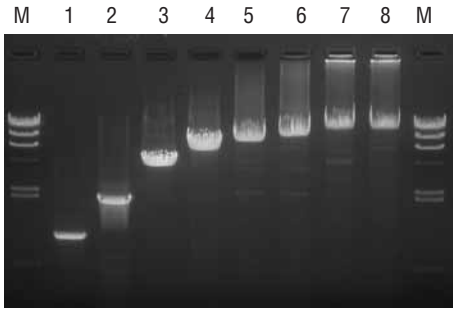
*Mg^{2+} Concentration: 10X Fast Buffer I, 30mM; 10X Fast Buffer II, 20mM.



SpeedSTAR™ HS DNA Polymerase

M λ*Hin*d III digest
1. 1 kb
2. 2 kb
3. 4 kb
4. 6 kb
5. 8 kb
6. 10 kb
7. 18 kb
8. 20 kb

M λ*Hin*d III digest



Standard High Efficiency Hot Start PCR Enzyme

M λ*Hin*d III digest
1. 1 kb
2. 2 kb
3. 4 kb
4. 6 kb
5. 8 kb
6. 10 kb
7. 18 kb
8. 20 kb

M λ*Hin*d III digest

High Speed PCR on Any Cycler

Amplification Efficiency of SpeedSTAR™ and a Standard High Efficiency PCR Enzyme was Performed using 8 Different Fragment Sizes. Eight different *E. coli* genomic DNA targets were amplified using SpeedSTAR™ and a standard high efficiency enzyme using the Takara DICE* thermocycler. Fast Buffer I was used in lanes 1 and 2; Fast Buffer II was used in lanes 3-8.

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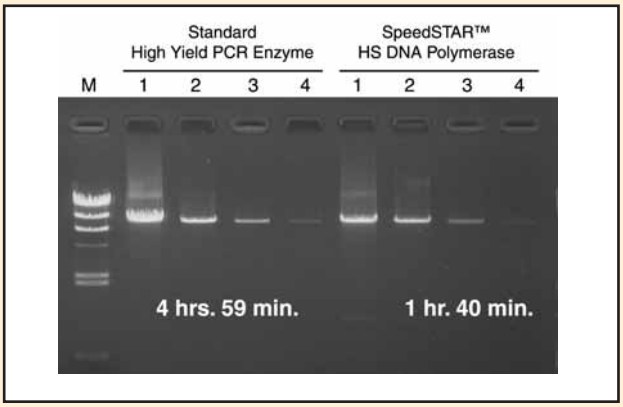
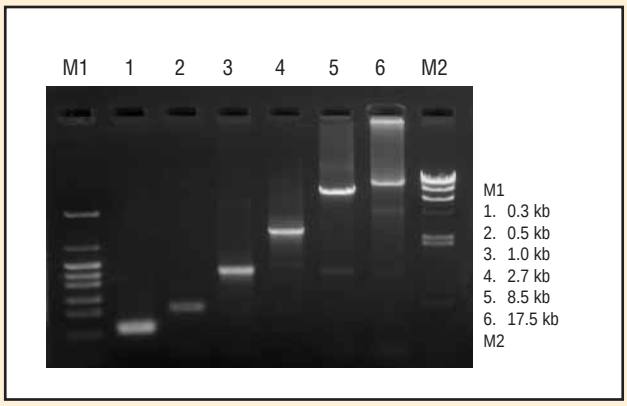
Applications: SpeedSTAR™ HS DNA Polymerase

This SpeedSTAR™ data demonstrates a dramatic decrease in reaction time for all fragment sizes. SpeedSTAR™ allows the ability to amplify fragments in 1/3 the time of regular PCR reactions, substantially improving the productivity of any lab working with any size fragment. In addition to increased speed, SpeedSTAR™ can amplify fragments up to 17.5 kb for genomic DNA.



Amplification of an 8.5 kb Human Genomic DNA Fragment using a Standard High Yield Polymerase and SpeedSTAR™. Quantities of human genomic DNA used in lane 1: 100 ng, lane 2: 10 ng, lane 3: 1 ng and lane 4: 0.1 ng.



Amplification of Human Genomic DNA Targets of Varying Sizes using SpeedSTAR™.

Target Genome: *E. coli*

Fragment size	Target genome	Standard PCR	SpeedSTAR™ HS Polymerase
1 kb-2 kb	*E. coli*	96 min (2-step)	33 min
4 kb- 6 kb	*E. coli*	226 min (2-step)	53 min
8 kb- 10 kb	*E. coli*	346 min (2-step)	83 min
18 kb-20 kb	*E. coli*	8 hrs 16 min (2-step)	3 hrs 29 min

Table 1: Time Comparison of SpeedSTAR™ and Standard High Efficiency Enzyme Reaction Times on *E. coli* Fragments of Varying Sizes. (2-step refers to PCR cycler conditions)

Target Genome: Human

Fragment size	Target genome	Standard PCR	SpeedSTAR™ HS Polymerase
8.5 kb	Human	4 hrs 59 min (2-step)	1 hr 40 min
17.5 kb	Human	8 hrs 16 min (2-step)	3 hr 29 min

Table 2: Time Comparison of SpeedSTAR™ and Standard High Efficiency Enzyme Reaction Times on Large Size Human Genomic Targets. (2-step refers to PCR cycler conditions)

LONG PCR

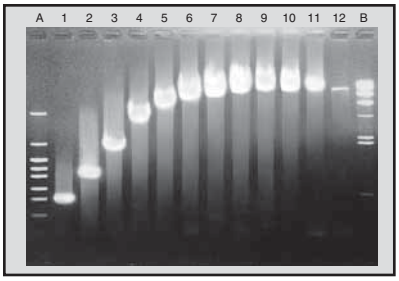
Takara's *LA Taq*™ DNA Polymerase

Features

- **Long Amplifications:** Up to 30 Kb for human genomic and complex GC-rich template DNA or 48 Kb for λDNA.
- **Improved Fidelity:** 6.5X better than *Taq.*
- **Minimal Optimization Required.**
- **Excellent Yield:** Large quantities of desired template.

Application(s)

- Long PCR (up to 48 kb on λ templates, 30 kb on genomic templates)
- GC-rich templates, secondary structures, difficult templates
- High polysaccharide (plant) or "dirty" samples
- PCR from genomic DNA of various organisms (*C. elegans, Helicobacter pylori,* beluga whale, zebra fish, *Arabidopsis, Mycobacterium bovis, etc.)*



Amplification of DNA fragments from 0.5-35 kb in size (different primer sets) using *LA Taq*™. *LA Taq*™ DNA Polymerase was used to amplify the various fragments and generated high product yields, even with very long (28 kb) fragments.

Description

Takara *LA Taq*™ is a mixture of *Taq* Polymerase with a proofreading polymerase optimized for amplification of long DNA templates. Using *LA Taq*™, routine extension to 20 kb and up to 48 kb is possible on some templates, with less optimization and greater product yield than other long PCR systems. Because of the presence of the proofreading polymerase, the fidelity is significantly better (6.5X) than that of *Taq* Polymerase alone.

Kit Components

FREE SAMPLE AVAILABLE

RR002M

LA Taq™ DNA Polymerase	250 U (5 U/µL)*
10X LA PCR Buffer II (contains 25 mM $MgCl_2$)	1 mL
dNTP Mixture (2.5 mM each dNTP)	800 µL

RR002A

LA Taq™ DNA Polymerase	125 U (5 U/µL)*
10X LA PCR Buffer II (without Mg^{2+})	1 mL
25 mM $MgCl_2$	1 mL
dNTP Mixture (2.5 mM each dNTP)	400 µL

*Protocol recommends the use of 2.5 U per 50 µL reaction.

Trouble-Free Long PCR

Try our *LA Taq*™ Hot Start DNA Polymerase (page 16)

LA PCR Kit, Version 2.1

Features

- **Contains All Reagents Required:** For optimizing long PCR.
- **Easier Optimization:** For long PCR.
- **Contains both Standard and GC Buffers:** For difficult long templates and high GC-content, with strong secondary structure templates.

Application(s)

- Amplification of large DNA templates (30 kb genomic or 48 kb λ DNA)
- Longer and more accurate genomic PCR products
- Amplification of difficult long fragment

Description

The LA PCR Kit includes all the reagents necessary for amplification of large DNA templates, with routine extension to 30 kb (and up to 48 kb possible with some templates.) The Version 2.1 Kit combines Takara's *LA Taq*™ DNA Polymerase with an optimized buffer system resulting in longer and more accurate PCR products than conventional PCR reagents. High fidelity (6.5-fold better than conventional *Taq* DNA Polymerase) is facilitated by an efficient 3'→5' exonuclease activity. The Version 2.1 Kit contains a control template, primers and markers to ensure premium PCR performance.

Kit Components

RR013A

LA Taq™ DNA Polymerase	125 U (5 U/µL)
10X LA PCR Buffer II (contains 25 mM Mg^{2+})	250 µL
10X LA PCR Buffer II (without Mg^{2+})	250 µL
$MgCl_2$ (25 mM)	500 µL
dNTP Mixture (2.5 mM each dNTP)	400 µL
Control Template (100 ng/µL HT29 DNA)	10 µL
Control Primer LA3 (10 pmol/µL)*	10 µL
Control Primer LA4 (10 pmol/µL)*	10 µL
λ-*Hin*d III MW Markers (100 ng/µL)	20 µL
2X GC Buffer I (contains 5 mM $MgCl_2$)	1.25 mL
2X GC Buffer II (contains 5 mM $MgCl_2$)	1.25 mL
Control Primer GC1 (10 pmol/µL)**	10 µL
Control Primer GC2 (10 pmol/µL)**	10 µL

* Amplifies a 17.5 kb region of the Control Template.

** Amplifies a 1,255 bp GC-rich region of the Control Template.

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GC-RICH PCR

Takara *LA Taq*™ DNA Polymerase with GC Buffers

Features

- **GC Buffers I & II for High GC and 2° Structures.**
- **Better Results on Difficult Templates.**

Application(s)

- More accurate amplification of genomic PCR amplification
- Amplification of GC-rich templates

High Efficiency GC-Rich PCR

Description

Takara *LA Taq*™ is a mixture of *Taq* Polymerase with a proofreading polymerase optimized for amplification of long DNA templates. Using *LA Taq*™, routine extension to 20 kb is possible (and up to 48 kb on some templates), with less optimization than other long PCR systems. Because of the presence of the proofreading polymerase, fidelity is significantly better (6.5X) than *Taq* Polymerase alone.

The GC-optimized Buffers I and II are specifically designed to amplify DNA templates with high GC content or a significant amount of secondary structure.

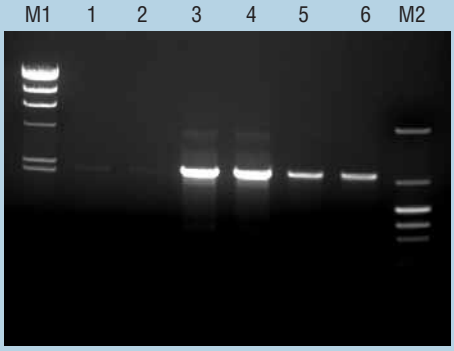
GC Buffer I is recommended for amplification of fragments ≥5kb, GC Buffer II is recommended for 2–3 kb fragments.

Kit Components

RR02AG

LA Taq™ DNA Polymerase	125 U (5 U/µL)*
2X GC Buffer I (contains 5 mM $MgCl_2$)	1.25 mL
2X GC Buffer II (contains 5 mM $MgCl_2$)	1.25 mL
dNTP Mixture (2.5 mM each dNTP)	400 µL

*Protocol recommends the use of 2.5 U per 50 µL reaction.

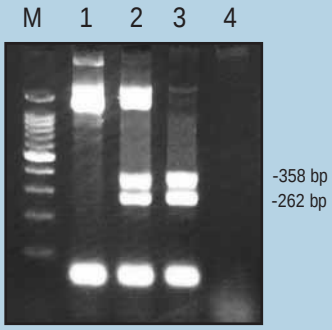


Comparison of Amplification Efficiency between *LA Taq*™ with GC Buffer and *LA Taq*™ using a GC-rich Target Fragment. A 2.1 kb mouse rRNA gene with 63.4% GC was amplified from 1 ng of mouse genomic DNA The results show *LA Taq*™ with GC Buffer gave optimal results in amplification of the 2.1 kb fragment with both excellent yields and high specificity.

M1.: λ -*Hin*d III digest
1 & 2: *LA Taq*™ / LA PCR Buffer II
3 & 4: *LA Taq*™ with GC Buffer/ GC Buffer I
5 & 6: *LA Taq*™ with GC Buffer/ GC Buffer II
M2: pHY Marker

PCR condition:

94°C 4 min
95°C 40 sec
70°C 3 min
} 40 cycles



Amplification of a Huntington's Disease Gene (high GC content). Purified human genomic DNA (100 ng in a 50 µL reaction) was used as a template for PCR with *LA Taq*™ DNA Polymerase and either LA PCR Buffer II (lane 1), GC Buffer I (lane 2), or GC Buffer II (lane 3), or with a competing DNA Polymerase and high GC Kit (lane 4). The primers amplified regions of the HD gene IT15 CAG repeat. The sizes of the amplified products were 262 bp (GC content 73%), and 358 bp (GC content 71.5%). Lane M contains a 100 bp ladder.

See also PrimeSTAR™ HS with GC Buffers (page 4)

ROUTINE, HIGH PERFORMANCE AND YIELD PCR

Takara *Ex Taq*™ DNA Polymerase

Features

- **Sensitivity and Efficiency:** Start with less DNA template and make more product than *Taq*.
- **Reliability/Reproducibility:** Tolerant to variations in template quality and quantity.
- **Increased Fidelity:** 4.5X better than *Taq*.
- **Minimal Optimization Required.**
- **Wide Length Range:** Makes both small (<100 bp) and large (up to 20 kb) products.

Application(s)

- Amplify DNA fragments of varying sizes (<100 bp, up to 30 kb lambda, 20 kb genomic)
- Amplify "Dirty" DNA, difficult templates and high polysaccharide samples (plant)
- High sensitivity, low abundance, high-yield PCR (works well for microarray production of DNA)
- PCR from genomic DNA of various organisms (*Drosophila*, cow rumen, beluga whale, puffer fish, *Arabidopsis*)

Description

Takara's *Ex Taq*™ DNA Polymerase combines the proven performance of Takara *Taq* DNA Polymerase with an efficient 3'→5' exonuclease activity for unsurpassed PCR performance. In routine PCR applications, the *Ex Taq*™ Polymerase and *Ex Taq*™ Buffer system gives higher yields and lower mutation rates (approximately 4.5X lower, as determined by the Kunkel method) than standard *Taq* DNA Polymerase. The system also allows amplification of longer products than *Taq* DNA Polymerase, with 20 kb lengths possible from genomic DNA and up to 30 kb possible from λ DNA.

Kit Components

FREE SAMPLE AVAILABLE

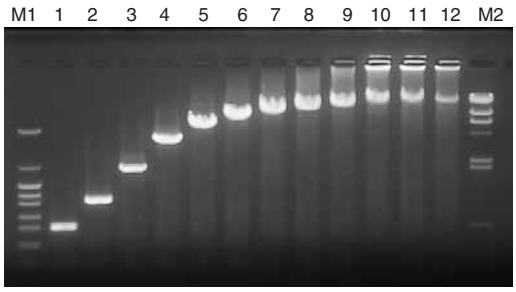
RR001A

Ex Taq™ DNA Polymerase	250 U (5 U/µL)*
10X *Ex Taq*™ Buffer (contains 20 mM $MgCl_2$)	1 mL
dNTP Mixture (2.5 mM each dNTP)	800 µL

RR01AM

Ex Taq™ DNA Polymerase	250 U (5 U/µL)*
10X *Ex Taq*™ Buffer (without $MgCl_2$)	1 mL
25 mM $MgCl_2$	1 mL
dNTP Mixture (2.5 mM each dNTP)	800 µL

* Protocol recommends the use of 1.25 U per 50 µL reaction.



M1: pHY Marker
1: 0.5 kb
2: 1 kb
3: 2 kb
4: 4 kb
5: 6 kb
6: 8 kb
7: 10 kb
8: 12 kb
9: 15 kb
10: 20 kb
11: 28 kb
12: 35 kb
M2: λ-HindIII digest

High Yield and Sensitivity

Amplification of Varying Fragment Sizes of λ Phage DNA using Takara's *Ex Taq*™ DNA Polymerase.

Takara *Ex Taq*™ DNA Polymerase Premix

Features

- **High Yield and Sensitivity:** Yield up to 100X greater than *Taq*; amplify from as little as 5 template copies.
- **Convenient:** Premix format allows simple assembly.
- **Decreased Contamination Risk:** Reduced pipetting decreases contamination.

Application(s)

- High throughput amplification
- Convenient, minimal-assembly amplifications
- High sensitivity, low abdundance, high-yield PCR (works well for microarray production of DNA)
- Consistent well to well results

Description

Takara's *Ex Taq*™ Premix contains *Ex Taq*™ DNA Polymerase, buffer, Mg^{2+} and dNTPs in a convenient, two-fold concentrate, single-solution format. This solution provides the same high performance as standard *Ex Taq*™ DNA Polymerase. The convenient premixed reagents save time and minimize the possibility of contamination.

Kit Components

RR003

Ex Taq™ DNA Polymerase Premix*	6 x 500 µL

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PerfectShot™ *Ex Taq*™ DNA Polymerase

Features

- **Convenient:** Amplify and load your sample directly on to gel.
- **Simply Assembly:** Allows simple assembly and processing.
- **High Yield and Sensitivity PCR.**
- **Consistent Results:** No variation from well to well.

Application(s)

- Direct loading of sample onto a gel after PCR amplification
- PCR from various lengths of DNA fragments (< 100 bp, up to 30 kb λ, 20 kb genomic)

Description

PerfectShot™ *Ex Taq*™ is a convenient 2X PCR solution (supplied in a 0.2 mL PCR tube) which contains Takara's high performance *Ex Taq*™ DNA Polymerase, reaction buffer, dNTP mixture and loading dye (2-fold concentration), and allows direct loading of the amplified reaction mix onto a TAE gel without the addition of a separate gel loading buffer. Use of high yield *Ex Taq*™ plus the convenience of direct gel loading results in consistent, reproducible results for any application.

Kit Components

RR005A

PerfectShot™ *Ex Taq*™ DNA Polymerase**	1.2 ml

** Contains *Ex Taq*™ DNA Polymerase (1.25U/25µl), dNTP (0.4mM ea.), *Ex Taq*™ Buffer (2X), and Loading Dye (Orange G/Bromophenol Blue).

Taq DNA Polymerase and *Taq* DNA Polymerase, Premix

Features

- **Low DNA Contamination:** Certified to be free of contaminating *E.coli* DNA.
- **Reliable and Reproducible:** Consistent lot-to-lot results.

Application(s)

- Routine PCR
- Thermal cycle sequencing

Description

Takara *Taq* Polymerase is a recombinant, thermostable, 94 kDa DNA polymerase encoded by the DNA polymerase gene of the *Thermus aquaticus* YT-1 strain which has been cloned into *Escherichia coli*. It has been shown to have essentially the same characteristics as native *Taq* DNA polymerase.

Taq DNA Polymerase is a versatile thermostable DNA polymerase suitable for a variety of standard PCR applications. The enzyme is supplied in either separate components or in a premix format (a mixture of enzyme, buffer, and dNTPs) which simplifies the setup of PCR reactions and minimizes pipetting steps.

Kit Components

FREE SAMPLE AVAILABLE

R001A

Taq DNA Polymerase	250 U (5 U/µL)*
10X PCR Buffer (contains 15 mM $MgCl_2$)	1 mL
dNTP Mixture (2.5 mM each dNTP)	800 µL

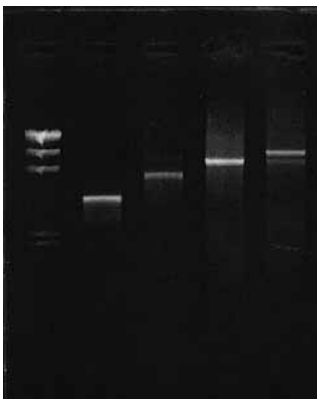
R001AM

Taq DNA Polymerase	250 U (5 U/µL)*
10X PCR Buffer (without Mg^{2+})	1 mL
25 mM $MgCl_2$	1 mL
dNTP Mixture (2.5 mM each dNTP)	800 µL

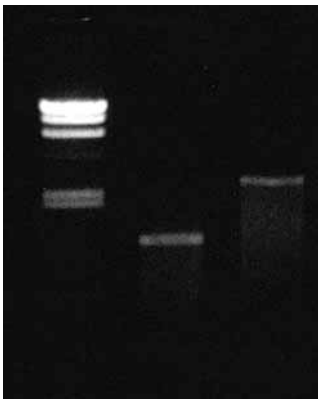
R004A

2X *Taq* Polymerase Premix**	6 x 500 µL

*Protocol recommends the use of 1.25 U per 50 µL reaction.
**Contains *Taq* DNA Polymerase, PCR Buffer and dNTPs.



Amplification of λ DNA. A sample containing 1 ng of λ DNA was amplified with Takara *Taq* DNA Polymerase, using various sets of primers. The PCR products were analyzed by agarose gel electrophoresis: lane 1, 4 kb; lane 2, 6 kb; lane 3, 8 kb; lane 4, 10 kb; lane M, λ-*Hin*d III DNA markers.



Amplification of a Single-Copy Gene. Amplification was performed using Takara *Taq* DNA Polymerase, human placental genomic DNA (100 ng) as a template, and primers that amplified two different regions of the human p53 gene. The size of the amplified products were 1.2 kb (lane 1) and 2.9 kb (lane 2). Lane M contains λ–*Hin*d III DNA markers.

HOT START PCR

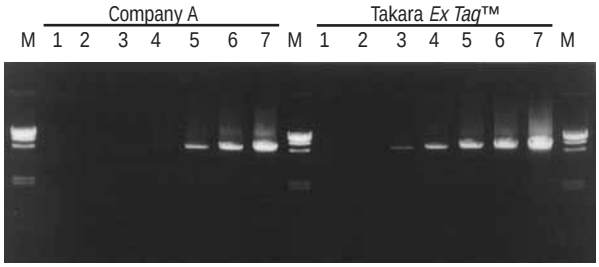
Takara *Ex Taq*™ DNA Polymerase, Hot-Start Version

Features

- **Increased Specificity** for reduced mispriming and primer dimers.
- **Facilitates High Throughput Amplifications.**
- **Superior Results on Difficult Templates.**
- **Room Temperature Assembly and Reduced Background.**

Application(s)

- Robust, specific amplification with reduced background
- Amplifications requiring room-temperature reaction assembly



Amplification Efficiency Comparison Between Takara's *Ex Taq*™ HS DNA Polymerase and Company A High-Grade Hot Start PCR Enzyme from Company A. A 7.5 kb human genomic DNA target was amplified from increasing amounts of template DNA. The results demonstrate the excellent sensitivity and yield of the *Ex Taq*™ HS DNA Polymerase. Lane M: λ-*Hin*d III digest, Lane 1: 100 pg, Lane 2: 300 pg, Lane 3: 1 ng, Lane 4: 3 ng, Lane 5: 10 ng, Lane 6: 30 ng, Lane 7: 100 ng.

Description

Takara's *Ex Taq*™ HS DNA Polymerase includes a monoclonal antibody to *Taq* Polymerase which binds to the polymerase until the temperature is elevated. The binding of this antibody prevents non-specific amplification due to mispriming and/or formation of primer dimers during reaction assembly. The antibody is then denatured in the initial PCR DNA-denaturation step, releasing the polymerase and allowing DNA synthesis to proceed.

Ex Taq™ HS DNA Polymerase offers the same high performance as the standard *Ex Taq*™ Polymerase, including high yield, excellent sensitivity, and fidelity 4.5X better than *Taq* Polymerase, along with the advantages of hot-start: lower background, increased specificity, and room temperature reaction assembly.

Kit Components

FREE SAMPLE AVAILABLE

RR006A

Ex Taq™ HS DNA Polymerase	250 U (5 U/µL)§
10X *Ex Taq*™ Buffer (contains 20 mM $MgCl_2$)	1 mL
dNTP Mixture (2.5 mM each dNTP)	800 µL

§Protocol recommends use of 1.25 U per 50 µL reaction.

RR030A Premix Version New

Premix *Ex Taq*™ HS*	5 x 500 µL

More Convenient, Now Available in a Premix!

Takara *LA Taq*™ DNA Polymerase, Hot-Start Version

Features

- **Increased High Specificity in Long Amplifications.**
- **High Throughput Capacity in Long PCR.**
- **Amplifies Difficult Templates.**
- **Multiplex PCR.**

Application(s)

- Long amplifications synthesizing products up to 30 kb (genomic DNA) and 48 kb (λDNA)
- High fidelity amplifications, (6.5X higher than *Taq* DNA Polymerase)
- Robust enzyme-buffer amplification with less optimization and greater yield than other long polymerases
- Reduced background and increased reaction specificity

Description

LA Taq™ Hot-Start DNA Polymerase consists of *LA Taq*™ DNA Polymerase plus a monoclonal antibody to *Taq* Polymerase. It retains all of the high performance features of *LA Taq*™ DNA Polymerase, and additionally provides increased reaction specificity and reduced background. The key features of *LA Taq*™ DNA Polymerase are; synthesis of products up to 30 kb (genomic DNA) and 48 kb (λDNA), 6.5X higher fidelity than *Taq* DNA Polymerase; and less optimization and greater product yield than other long polymerases due to the robust enzyme-buffer system. Room temperature reaction assembly is possible with this formulation.

Kit Components

RR042A

LA Taq™ HS DNA Polymerase	125 U (5 U/µL)*
10X *LA Taq*™ Buffer (Mg^{2+} Free)	1 mL
dNTP Mixture (2.5 mM each dNTP)	400 µL

*Protocol recommends the use of 2.5 U per 50 µL reaction.

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MULTIPLEX PCR

Sensitive, Reliable Multiplex PCR by Using Takara Hot-Start *Taq*

Introduction

Multiplex PCR is a variant of traditional PCR which allows simultaneous amplification of numerous targets using multiple primer pairs in a single amplification reaction. This approach is used in many areas of scientific research, including genotyping applications which require analysis of multiple markers. It is also used in pathogen detection and deletion, mutation, and polymorphism investigation. The technique is demanding, and successful multiplex amplifications require careful primer design, reaction optimization, and a specific, sensitive, and reliable DNA Polymerase.

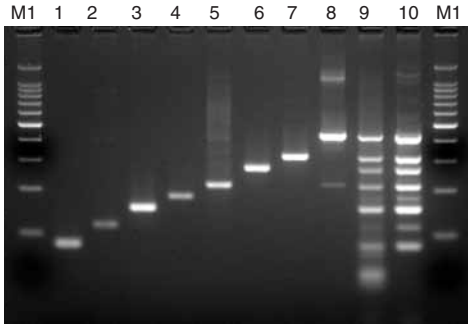
Takara's Hot-Start *Taq* DNA Polymerase contains a mixture of Takara's high-purity *Taq* DNA Polymerase and a monoclonal antibody to *Taq*, which binds to the polymerase until the temperature is elevated. The binding of this antibody prevents nonspecific amplification due to mispriming and/or formation of primer dimers during reaction assembly. The antibody is then denatured in the initial PCR DNA-denaturation step, releasing the polymerase and allowing DNA synthesis to proceed. *Taq* HS Polymerase provides sensitive, reliable amplification, along with reduced background and increased reaction specificity and efficiency.

Materials and Methods

PCR reactions were performed using Takara *Taq* or *Taq* HS to amplify a human genomic DNA template with eight different primer pairs, each specific for a target ranging from 84 to 432 bp in size. Lanes 1-8 contain individual reactions for each primer pair amplified using Takara HS *Taq*. Lanes 9 and 10 include multiplex PCR reactions containing all eight primer pairs in a single tube, amplified with either *Taq* (lane 9) or *Taq* HS DNA Polymerase (lane 10).

Results

The results show that multiplex PCR using *Taq* HS results in target amplification efficiencies equivalent to that of separate (single target) amplification reactions. In addition, *Taq* HS demonstrates superior efficiency and specificity over standard *Taq* Polymerase in this multiplex PCR application.



Amplification of Various Human Genomic DNA Fragments using a Standard *Taq* DNA Polymerase and *Taq* Hot Start DNA Polymerase. PCR reactions were performed using human genomic DNA as a template and 8 different primers for each single fragment. All fragments are amplified together in lane 9 (using Standard *Taq*) and lane 10 (using *Taq* Hot Start).

Takara *Taq* DNA Polymerase, Hot-Start Version

Features

- **Increased Specificity in Standard Amplifications.**
- **High Throughput Capacity in Standard PCR.**
- **Allows Room Temperature Assembly; Reduced Background.**
- **Excellent for Multiplex PCR.**

Application(s)

- Multiplex PCR
- Reduced background and increased reaction specificity
- Reliable, consistent standard and qPCR amplifications

Description

Taq HS DNA Polymerase contains a mixture of Takara *Taq* Polymerase and a monoclonal antibody to *Taq* Polymerase, which binds to the polymerase until the temperature is elevated. The binding of this antibody prevents nonspecific amplification due to mispriming and/or formation of primer dimers during reaction assembly. The antibody is then denatured in the initial PCR DNA-denaturation step, releasing the polymerase and allowing DNA synthesis to proceed.

***Taq* HS DNA Polymerase, Premix**

Taq HS DNA Polymerase, premix is an optimized mixture composed of TaKaRa *Taq* HS, a reaction buffer and dNTP mixture in 2-fold concentrations.

Kit Components

FREE SAMPLE AVAILABLE

R007A

Taq HS DNA Polymerase	250 U (5 U/µL)*
10X PCR Buffer	(contains 15 mM $MgCl_2$) 1 mL
dNTP Mixture	(2.5 mM each dNTP) 800 µL

*Protocol recommends the use of 1.25 U per 50 µL reaction.

R028A New

Taq HS DNA Polymerase, Premix*	5 x 500 µL

*Contains dNTP Mixture 2Xconc.; ea. 0.4 mM and PCR buffer 20 mM Tris-HCl, pH8.3, 100 mM KCl and 3 mM 2X conc. $MgCl_2$

Guide to Takara

Polymerase*	Amplification Efficiency	Product Size λ DNA Recommended/Max	Product size Human Genomic DNA Recommended/Max	Fidelity	Proofreading Activity	Specificity
PrimeSTAR™ HS*	+++	up to 20 kb	up to 8.5 kb	10 X *Taq*#	Yes	++++
PrimeSTAR™ HS with GC buffers	+++	up to 10 kb	up to 5 kb	10 X *Taq*#	Yes	++++
PrimeSTAR™ HS, Premix	+++	up to 10 kb	up to 5 kb	10 X *Taq*#	Yes	++++
SpeedSTAR™ HS*	++	20 kb/30 kb	10 kb/ 20 kb	4.5 X *Taq***	Yes	++++
Ex Taq™*	++++	20 kb/30 kb	10 kb/20 kb	4.5 X *Taq***	Yes	++
Premix *Ex Taq*™	++++	20 kb/30 kb	10 kb/20 kb	4.5 X *Taq***	Yes	++
Ex Taq™ HS*	++++	20 kb/30 kb	10 kb/20 kb	4.5 X *Taq***	Yes	++++
Ex Taq™ HS, Premix	++++	20 kb/30 kb	10 kb/20 kb	4.5 X *Taq***	Yes	++++
Ex Taq™ R-PCR	++++	_	_	4.5 X *Taq***	Yes	++++
Premix *Ex Taq*™* (Perfect Real Time)	++++	_	_	4.5 X *Taq***	Yes	++++
SYBR Premix *Ex Taq*™* (Perfect Real Time)	++++	_	_	4.5 X *Taq***	Yes	++++
LA Taq™*	+++	35 kb/48 kb	20 kb/30 kb	6.5 X *Taq***	Yes	++
LA Taq™ w/GC Buffer	+++	35 kb/48 kb§	(20 kb/30 kb)§	(6.5 X *Taq*)‡**	Yes	++
LA PCR Kit, V.2.0	+++	35 kb/48 kb	20 kb/30 kb	6.5 X *Taq***	Yes	++
One-Shot LA PCR Mix	+++	35 kb/48 kb	20 kb/30 kb	6.5 X *Taq***	Yes	++
LA Taq™ HS	+++	35 kb/48 kb	20 kb/30 kb	6.5 X *Taq***	Yes	++++
*Taq**	++	6 kb/12 kb	2 kb/4 kb	1 X *Taq***	No	++
Premix *Taq*	++	6 kb/12 kb	2 kb/4 kb	1 X *Taq***	No	++
Taq HS*	++	6 kb/12 kb	2 kb/4 kb	1 X *Taq***	No	++++
Taq HS, Premix	++	6 kb/12 kb	2 kb/4 kb	1 X *Taq***	No	++++

* Free Sample Available

Unit Definition

One unit is the amount of enzyme that will incorporate 10 nmol of dNTP into acid-insoluble products in 30 min. at 74°C with activated salmon sperm DNA as the template-primer.

Purity

Nicking activity, endonuclease, and exonuclease activity were not detected after the incubation of 0.6 µg of double-stranded supercoiled pBR322 DNA, 0.6 µg of λ DNA, or 0.6 µg of λ-*Hin*d III digest with 10 units of enzyme for 1 hour at 74°C.

PCR Polymerases

Convenience	GC-Rich Templates	Hot-Start PCR	Real Time PCR (QPCR)	Low DNA Enzyme	Processing Speed	Guidelines for Length of Primers	Terminal Transferase Activity (3'-A overhang)
++	++++	++++	_	≤ 10 fg	1-2 kb/min	20-30 bp	No (blunt end)
++	++++	++++	_	≤ 10 fg	1-2 kb/min	20-30 bp	No (blunt end)
++++	++++	++++	_	≤ 10 fg	1-2 kb/min	20-30 bp	No (blunt end)
++	+	++++	_	≤ 10 fg	6 kb/min	20-30 bp	Yes
++	+	_	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes
++++	+	_	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes
++	+	++++	++	≤ 10 fg	1-2 kb/min	20-30 bp	Yes
++++	+	++++	++	≤ 10 fg	1-2 kb/min	20-30 bp	Yes
++	+	++++	++++	≤ 10 fg	_	17-25 bp	Yes
++++	+	++++	++++	≤ 10 fg	_	17-25 bp	Yes
++++	+	++++	++++	≤ 10 fg	_	17-25 bp	Yes
++	+	_	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes+
++	++++	_	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes+
++	++++	_	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes+
++++	+	_	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes+
++	+	++++	_	≤ 10 fg	1-2 kb/min	20-30 bp	Yes+
++	+	_	_	≤ 10 fg	1 kb/min	20-30 bp	Yes
++++	+	_	_	≤ 10 fg	1 kb/min	20-30 bp	Yes
++	+	++++	+++	≤ 10 fg	1 kb/min	20-30 bp	Yes
++++	+	++++	+++	≤ 10 fg	1 kb/min	20-30 bp	Yes

*** All of Takara's PCR polymerases are provided with dNTPs and buffer.**
+ T-vector cloning efficiency diminishes as the length of the PCR product to be cloned increases above 5 kb.
§ When used with GC Buffer I.
‡ When amplifying GC-rich templates, the fidelity is reduced.
**** All fidelity determined by using the Kunkel method.**
 # Fidelity determined by direct sequencing.
For more information, see our website at www.takara-bio.com

Ordering Information

Ex Taq™ Products

Product No.	Description	Quantity
RR001A	*Ex Taq*™ DNA Polymerase	250 units (200 reactions)
RR001B	*Ex Taq*™ DNA Polymerase	1,000 units (800 reactions)
RR01AM	*Ex Taq*™ DNA Polymerase (Mg^{2+}-free Buffer)	250 units (200 reactions)
RR01BM	*Ex Taq*™ DNA Polymerase (Mg^{2+}-free Buffer)	1,000 units (800 reactions)
RR003	*Ex Taq*™ DNA Polymerase Premix	500 µl x 6 (120 reactions)
RR005A	PerfectShot™ *Ex Taq*™ DNA Polymerase	48 reactions)
RR006A	*Ex Taq*™ Hot Start DNA Polymerase	250 units (200 reactions)
RR006B	*Ex Taq*™ Hot Start DNA DNA Polymerase	1,000 units (800 reactions)
RR030A	*Ex Taq*™ Hot Start DNA DNA Polymerase, Premix	100 reactions
RR031A	*Ex Taq*™ R-PCR, Version 2.1	250 units (200 reactions)
RR031B	*Ex Taq*™ R-PCR, Version 2.1	1,000 units(800 reactions)
RR039A	Premix *Ex Taq*™ (Perfect Real Time)	200 reactions
RR039B	Premix *Ex Taq*™ (Perfect Real Time)	400 reactions
RR041A	SYBR® Premix *Ex Taq*™ (Perfect Real Time)	200 reactions
RR041B	SYBR® Premix *Ex Taq*™ (Perfect Real Time)	400 reactions

LA Taq™ Products

Product No.	Description	Quantity
RR002T	*LA Taq*™ DNA Polymerase (Trial Size)	50 reactions
RR002M	*LA Taq*™ DNA Polymerase	250 units (100 reactions)
RR002B	*LA Taq*™ DNA Polymerase	1000 units (400 reactions)
RR002C	*LA Taq*™ DNA Polymerase	3,000 units (1200 reactions)
RR002A	*LA Taq*™ Supplement (Mg^{2+}-free Buffer)	125 units (50 reactions)
RR02AG	*LA Taq*™ DNA Polymerase (with GC Buffers)	125 units (50 reactions)
RR004	One Shot LA PCR Mix (with GC Buffers)	24 reactions
RR013A	LA PCR Amplification Kit, Version 2.1	50 reactions
RR013B	LA PCR Amplification Kit, Version 2.1	100 reactions
RR042A	*LA Taq*™ Hot Start DNA Polymerase	125 units (50 reactions)
RR042B	*LA Taq*™ Hot Start DNA Polymerase	500 units (200 reactions)

Taq Products

Product No.	Description	Quantity
R001A	*Taq* DNA Polymerase	250 units
R001B	*Taq* DNA Polymerase	1,000 units (4 x 250 units)
R001C	*Taq* DNA Polymerase	3,000 units (12 x 250 units)
R001AM	*Taq* DNA Polymerase (with Mg^{2+}-free Buffer)	250 units
R001BM	*Taq* DNA Polymerase (with Mg^{2+}-free Buffer)	1,000 units (4 x 250 units)
R001CM	*Taq* DNA Polymerase (with Mg^{2+}-free Buffer)	3,000 units (12 x 250 units)
R004A	*Taq* DNA Polymerase Premix	120 reactions (6 x 500 µL)
R007A	*Taq* Hot Start DNA Polymerase	250 units
R007B	*Taq* Hot Start DNA Polymerase	1000 units (4 X 250 units)
R028A	*Taq* Hot Start DNA Polymerase, Premix	100 reactions

STAR DNA Polymerases

Product No.	Description	Quantity
R010A	PrimeSTAR™ HS DNA Polymerase	250 units
R010B	PrimeSTAR™ HS DNA Polymerase	1000 units
R040A	PrimeSTAR™ HS DNA Polymerase Premix	100 reactions
R044A	PrimeSTAR™ HS DNA Polymerase with GC Buffer	250 units
R044B	PrimeSTAR™ HS DNA Polymerase with GC Buffer	1000 units
RR070A	SpeedSTAR™ HS DNA Polymerase	250 units
RR070B	SpeedSTAR™ HS DNA Polymerase	1000 units

dNTPs

Product No.	Description	Quantity	Concentration
4030	dNTP Mixture	3.2 µmol each	2.5 mM each
4025	dNTP Set	100 µmol each	4 tubes 100 mM each

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