DNA Amplification/PCR

Digital PCR

Droplet Digital™ PCR Instrument

Several areas of research depend on the ability to study target DNA sequence variations. Digital PCR technology offers the ability to quantify molecular genetic changes. It is employed by researchers using numerous applications such as copy number variation, rare mutation detection, gene expression analysis, cell-free DNA quantification, gene-editing validation, microRNA (miRNA) detection, genetically modified organism (GMO) quantification, biomarker discovery, and viral load quantification. Bio-Rad's QX200™ AutoDG™ Droplet Digital™ PCR and QX200 Droplet Digital PCR systems, combined with our ddPCR™ supermixes, ddPCR assays and kits, and reliable thermal cyclers, offer researchers an easy-to-use, highly precise, and reproducible digital PCR package.

Learn More about the Technology
Web: bio-rad.com/tech/ddPCR

See Also
C1000 Touch thermal cycler: page 357.
PX1 PCR plate sealer: page 386.

QX200™ Droplet Digital™ PCR System

The QX200 Droplet Digital PCR (ddPCR™) system provides an absolute quantification of target DNA or RNA molecules with unmatched precision and sensitivity for digital PCR applications.

Benefits

- Most precise and sensitive digital PCR solution for a wide variety of applications
- Flexible digital PCR chemistry — optimized for TaqMan hydrolysis probes and EvaGreen dye assays
- Flexible assay setup — scalable for high sensitivity or high throughput
- Simple and easy-to-use workflow with 96-sample throughput
- Droplet partitioning by the QX200 Droplet Digital technology reduces bias from amplification efficiency and PCR inhibitors
- Convenient assay design — standard curves are not required

Applications

- **Cancer biomarker studies** — superior sensitivity and resolution for measuring varying degrees of mutagenesis for detection of rare DNA target copies, copy number variation states, and allelic discrimination in tissue and liquid biopsy samples
- **Pathogen detection** — extremely high precision while measuring circulating DNA from biological samples (proven for HIV studies)
- **Gene expression analysis** — reliably measure low levels of mRNA and miRNA without using a standard curve
- **Next-generation sequencing (NGS)** — quantify NGS library preparations without the use of standard curves; validate NGS results
- **Environmental** — popular for quality testing in a wide variety of environmental samples such as soil and water
- **Food testing** — validated method for routine evaluation of GMOs
- **Genome editing** — detection of rare genome editing events and distinction between homology-directed repair and nonhomologous end-joining DNA repair mechanisms

The QX200 droplet generator partitions samples containing genomic DNA, cDNA, or RNA template into ~20,000 nanoliter-sized droplets (8 samples/run). After PCR using a Bio-Rad thermal cycler, droplets from each sample are streamed in single file through the QX200 droplet reader. The PCR-positive and PCR-negative droplets are counted to provide absolute quantification of target DNA in digital form (96 samples/run).

Accessories

Droplet generation and reader oils, ddPCR reagents, droplet generator cartridges, and gaskets are used with the system.

Automated Droplet Generator

The automated droplet generator allows hands-free droplet generation for up to 96 samples quickly and reproducibly.

- Provides a high-throughput solution for digital PCR with the QX200 ddPCR system
- Minimizes setup time for a 96-sample plate
- Requires no hands-on activity during droplet generation
- Eliminates user-to-user variability
- Reduces contamination risk during droplet generation

For More Information
Web: bio-rad.com/digitalpcr

Ordering Information

Catalog #	Description
QX200 Droplet Digital PCR System	
1864001	**QX200 Droplet Digital PCR System**, includes droplet generator, droplet reader, laptop computer, software, associated component consumables
1864100	**QX200 AutoDG Droplet Digital PCR System**, includes automated droplet generator, droplet reader, laptop computer
1864002	**QX200 Droplet Generator**, includes droplet generator, 1 box of 24 cartridges, 1 pkg of 24 gaskets, 2 cartridge holders, 1 power cord
1864101	**Automated Droplet Generator**, includes automated droplet generator, 1 power cord
1864003	**QX200 Droplet Reader**, includes droplet reader, 2 plate holders, 1 USB cable, 1 power cord
Consumables and Accessories for both QX100 and QX200 ddPCR Systems	
1863004	**ddPCR Droplet Reader Oil**, 2 x 1 L bottles
1863005	**Droplet Generation Oil for Probes**, 10 x 7 ml bottles
1864008	**DG8 Cartridges for QX100/QX200 Droplet Generator**, 1 pkg of 24 cartridges
1863009	**DG8 Gaskets for QX100/QX200 Droplet Generator**, 1 pkg of 24 gaskets
1864007	**Droplet Generator Cartridges and Gaskets**, 5 pkg of 24 DG8 cartridges, 5 pkg of 24 DG8 gaskets
1863051	**DG8 Cartridge Holder**
Consumables and Accessories for QX200 ddPCR System Only	
1864005	**Droplet Generation Oil for EvaGreen**, 2 x 7 ml bottles
1864006	**Droplet Generation Oil for EvaGreen**, 10 x 7 ml bottles
Consumables and Accessories for Automated Droplet Generator Only	
1864108	**DG32 Automated Droplet Generator Cartridges**, 1 pkg of 30, enough for 10 x 96-well ddPCR plates
1864109	**DG32 Automated Droplet Generator Cartridges**, 1 pkg of 60, enough for 20 x 96-well ddPCR plates
1864110	**Automated Droplet Generation Oil for Probes**, 140 ml, enough for 20 x 96-well ddPCR plates
1864112	**Automated Droplet Generation Oil for EvaGreen**, 140 ml, enough for 20 x 96-well ddPCR plates
1864120	**Pipet Tips for AutoDG System**, 1 pkg of 20, enough for 10 x 96-well ddPCR plates
1864121	**Pipet Tips for AutoDG System**, 1 pkg of 40, enough for 20 x 96-well ddPCR plates
1864125	**Pipet Tip Waste Bins for AutoDG System**, 1 pkg of 10, enough for 10 x 96-well ddPCR plates

Droplet Digital™ PCR System Reagents

Bio-Rad offers PCR reagents for exclusive use with the ddPCR™ system. These reagents include supermixes for probe-based target detection, supermix for double-stranded DNA detection, NGS library quantification kits, and PrimePCR™ assays for Droplet Digital PCR.

ddPCR Supermix Selection Guide

Application	ddPCR Supermix for Probes	ddPCR Supermix for Probes (No dUTP)	QX200 ddPCR EvaGreen Supermix	ddPCR Supermix for Residual DNA Quantification	One-Step RT-ddPCR Advanced Kit for Probes
Suitable for UNG decontamination protocols	•		•	•	•
PrimePCR ddPCR Mutation Detection Assays		•			
PrimePCR ddPCR Copy Number Assays		•			
PrimePCR Gene Expression Assays			•		
ddPCR Library Quantification Kit for Illumina TruSeq		•			
ddPCR Library Quantification Kit for Ion Torrent		•			
Double-stranded DNA detection			•		
Residual host cell DNA detection				•	
Absolute quantification of target RNA molecules					•

ddPCR, Droplet Digital PCR; dUTP, 2'-deoxyuridine 5'-triphosphate; UNG, uracil N-glycosylase.

ddPCR™ Supermix for Probes (No dUTP)

ddPCR supermix for probes (no dUTP) is a ready-to-use cocktail 2x supermix containing all components except primers and template. It is used for DNA sample preparation for applications such as NGS library preparation and PCR cloning.

- Limits nonspecific PCR amplification
- Allows for DNA recovery after amplification

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6338

Ordering Information

Catalog #	Description
1863023	**ddPCR Supermix for Probes (No dUTP)**, 2 x 1 ml vials, 2x supermix, for use in nucleic acid sample preparation with the QX100 or QX200 droplet generator
1863024	**ddPCR Supermix for Probes (No dUTP)**, 5 x 1 ml vials, 2x supermix, for use in nucleic acid sample preparation with the QX100 or QX200 droplet generator
1863025	**ddPCR Supermix for Probes (No dUTP)**, 5 x 5 ml vials, 2x supermix, for use in nucleic acid sample preparation with the QX100 or QX200 droplet generator

See Also
C1000 Touch thermal cycler: page 357.
PX1 PCR plate sealer: page 386.

New ddPCR™ Residual DNA Quantification Supermix and Kits

ddPCR residual DNA quantification supermix and kits enable precise quantification of low levels of Chinese hamster ovary (CHO), *Escherichia coli*, yeast, human, and mouse DNA for residual host cell DNA monitoring.

- Enables direct quantification of residual host cell DNA without the need for DNA extraction
- Minimizes nonspecific PCR amplification

For More Information
Web: bio-rad.com/digitalpcr

Ordering Information

Catalog #	Description	
1864037	**ddPCR Supermix for Residual DNA Quantification**, 2 x 1 ml vials, 2x supermix, for use in residual DNA detection with the QX100 or QX200 droplet generator	
1864038	**ddPCR Supermix for Residual DNA Quantificatio**n, 5 x 1 ml vials, 2x supermix, for use in residual DNA detection with the QX100 or QX200 droplet generator	
1864039	**ddPCR Supermix for Residual DNA Quantificatio**n, 5 x 5 ml vials, 2x supermix, for use in residual DNA detection with the QX100 or QX200 droplet generator	
1864040	**ddPCR Supermix for Residual DNA Quantification**, 10 x 5 ml vials, 2x supermix, for use in residual DNA detection with the QX100 or QX200 droplet generator	
17000031	**ddPCR Residual CHO Host Cell DNA Quantification Kit**, includes assay and supermix, for use in residual DNA detection with the QX100 or QX200 droplet generator	Inquire
17000032	**ddPCR Residual *E. coli* Host Cell DNA Quantification Kit**, includes assay and supermix, for use in residual DNA detection with the QX100 or QX200 droplet generator	Inquire

ddPCR™ Supermix for Probes

ddPCR supermix for probes is a ready-to-use 2x supermix used to partition and amplify DNA for digital PCR. It is suitable for use with UNG decontamination protocols, which prevent the reamplification of carryover PCR products between experiments.

- Ensures precise target quantification
- Uses standard cycling protocols for probe-based simplex or duplex Droplet Digital PCR
- Enables partitioning of sample into droplets to eliminate performance variations

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6338

Ordering Information

Catalog #	Description
1863026	**ddPCR Supermix for Probes**, 2 x 1 ml vials, 2x supermix, for use in sample preparation for QX100 or QX200 droplet generator
1863010	**ddPCR Supermix for Probes**, 5 x 1 ml vials, 2x supermix, for use in sample preparation for QX100 or QX200 droplet generator
1863027	**ddPCR Supermix for Probes**, 5 x 5 ml vials, 2x supermix, for use in sample preparation for QX100 or QX200 droplet generator
1863028	**ddPCR Supermix for Probes**, 10 x 5 ml vials, 2x supermix, for use in sample preparation for QX100 or QX200 droplet generator

New One-Step RT-ddPCR Advanced Kit for Probes

One-step RT-ddPCR advanced kit for probes is a reverse transcription digital PCR supermix delivering improved efficiency, specificity, and sensitivity for precise RNA target quantification. It contains thermostable enzymes that allow for RNA templates to be reverse transcribed and subsequently amplified in the same reaction tube.

- Optimized enzyme blend enables partitioning of RNA samples into droplets while keeping enzymes inactive until reverse transcription at 50°C
- Contains RNase inhibitor that protects the RNA throughout the workflow

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6250

Ordering Information

Catalog #	Description
1864021	**One-Step RT-ddPCR Advanced Kit for Probes**, 2 x 1 ml, 200 x 20 µl reactions
1864022	**One-Step RT-ddPCR Advanced Kit for Probes**, 5 x 1 ml, 500 x 20 µl reactions

QX200™ ddPCR™ EvaGreen Supermix

The QX200 ddPCR EvaGreen supermix is a ready-to-use 2x supermix containing a dsDNA binding dye used to partition and amplify DNA for digital PCR. It is the only dye chemistry optimized for digital PCR.

- Enables double-stranded DNA detection following PCR amplification
- Allows for the amplification and detection of DNA targets using commercially available EvaGreen assays

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6473

Ordering Information

Catalog #	Description
1864033	**QX200 ddPCR EvaGreen Supermix**, 2 x 1 ml vials, for use in nucleic acid sample preparation with the QX200 droplet generator
1864034	**QX200 ddPCR EvaGreen Supermix**, 5 x 1 ml vials, for use in nucleic acid sample preparation with the QX200 droplet generator
1864035	**QX200 ddPCR EvaGreen Supermix**, 5 x 5 ml vials, for use in nucleic acid sample preparation with the QX200 droplet generator
1864036	**QX200 ddPCR EvaGreen Supermix**, 10 x 5 ml vials, for use in nucleic acid sample preparation with the QX200 droplet generator

ddPCR™ Library Quantification Kits

The ddPCR library quantification kits are the optimal solution for quality control of NGS libraries. These kits have been experimentally validated to ensure optimal performance. The assays generate data plots that are rich with qualitative library information, a feature not available with other methodologies such as quantitative PCR. With absolute quantification, standard curves and size adjustment calculations are not necessary to obtain precise library quantitation. When paired with the QX200™ ddPCR system, these kits allow accurate quantification and provide a qualitative measure of the DNA library prior to sequencing on Illumina (1863040) or Ion Torrent (1863041) platforms.

- Contain all the necessary components to create droplets and quantify NGS libraries
- Provide both quantitative and qualitative data (including adapter dimers and insert sizes)
- Enable more efficient and consistent loading and balancing of libraries for sequencing runs

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletins: 6402 and 6490

Ordering Information

Catalog #	Description
1863040	**ddPCR Library Quantification Kit for Illumina TruSeq**, includes 1 vial of primers and probes at 20x concentration, 2x ddPCR supermix for probes (no dUTP)
1863041	**ddPCR Library Quantification Kit for Ion Torrent**, includes 1 vial of primers and probes at 20x concentration, 2x ddPCR supermix for probes (no dUTP)

PrimePCR™ ddPCR™ Assays

PrimePCR probe assays for the ddPCR system allow detection of small fold changes without a standard curve. PrimePCR ddPCR assays are predesigned, fully wet-lab validated assays. They are available in multiple formats.

Mutation Detection Assays

- Predesigned mutation detection probe assays are available in 200, 1,000, and 2,500 reaction sizes
- 1:2,000 detection of mutant:wild type in a single well
- Works on both QX100™ and QX200™ ddPCR platforms
- Uniform cycling conditions and primer/probe strategy
- Biologically relevant targets (for example, COSMIC v57)

Copy Number Assays

- Predesigned copy number probe assays are available in 200, 1,000 and 2,500 reaction sizes
- Universal/single restriction enzyme strategy used for assay design
- Works on both QX100 and QX200 ddPCR platforms
- Uniform cycling conditions and primer/probe strategy
- Primer specificity confirmed by next-generation sequencing

Gene Expression EvaGreen and Probe Assays

- Over 60,000 optimized assays available for human, mouse, and rat genomes
- Option of hydrolysis probe–based detection assays or unlabeled primer assays for use with EvaGreen dye
- Available with either FAM or HEX fluorophores
- Compatible with both the QX100 and QX200 ddPCR platforms

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6512

Ordering Information
Visit **bio-rad.com/PrimePCR** to place an order.

ddPCR™ *SMN1* Copy Number Determination Kit

The ddPCR *SMN1* copy number determination kit can be used for copy number determination of the survival motor neuron 1 (*SMN1*) gene. It contains a duplex assay, ddPCR supermix for probes (no dUTP) and positive controls for 0, 1, and 2 copies of *SMN1*.

- Predesigned and wet-lab validated copy number assay
- Uniform cycling conditions
- Contains all the necessary components to create droplets and determine copy number of the *SMN1* target

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6630

Ordering Information

Catalog #	Description
1863500	**ddPCR *SMN1* Copy Number Determination Kit**, includes assay at 20x concentration, 2x ddPCR supermix for probes (no dUTP), and positive controls

ddPCR™ *SMN2* Copy Number Determination Kit

The ddPCR *SMN2* copy number determination kit can be used for copy number determination of the survival motor neuron 2 (*SMN2*) gene. It contains a duplex assay, ddPCR supermix for probes (no dUTP) and positive controls for 2, 3, and 4 copies of *SMN2*.

- Predesigned and wet-lab validated copy number assay
- Uniform cycling conditions
- Contains all the necessary components to create droplets and determine copy number of the *SMN2* target

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6631

Ordering Information

Catalog #	Description
1863503	**ddPCR *SMN2* Copy Number Determination Kit**, includes assay at 20x concentration, 2x ddPCR supermix for probes (no dUTP), and positive controls

New ddPCR™ Mutation Screening Kits

ddPCR mutation screening kits are designed for rapid screening of several key cancer mutations in a single reaction with a limit of detection of 0.5% or better. These kits are ideal for use with DNA extracted from formalin-fixed, paraffin-embedded (FFPE) samples, liquid biopsy, fresh/frozen tissue, and samples with low yield or inhibitory substances. Assays for each of the mutations detected by the kit can also be ordered individually. The kits are recommended for use with fragmented samples such as FFPE tissue, cell-free DNA, and blood spots.

Kit	Mutations Detected
KRAS G12/13	*G12A, G12C, G12D, G12R, G12S, G12V, G13D*
BRAF V600	*V600E, V600K, V600R*
NRAS Q61	*Q61K, Q61L, Q61R , Q61H* (183A>C), *Q61H* (183A>T)
NRAS G12	*G12A, G12C, G12D, G12R, G12S, G12V*
NRAS G12/13	*G12A, G12C, G12D, G12S, G12V, G13D, G13R, G13V*
KRAS Q61	*Q61K, Q61L, Q61R, Q61H* (183A>C), *Q61H* (183A>T)

For More Information
Web: bio-rad.com/digitalpcr
Request or download bulletin: 6632

Ordering Information

Catalog #	Description
1863506	**ddPCR *KRAS G12/G13* Screening Kit**, includes 20x multiplex assay and 2x ddPCR supermix for probes (no dUTP)
12001626	**ddPCR *KRAS Q61* Screening Kit**, includes 20x multiplex assay and 2x ddPCR supermix for probes (no dUTP)
12001037	**ddPCR *BRAF V600* Screening Kit**, includes 20x multiplex assay and 2x ddPCR supermix for probes (no dUTP)
12001006	**ddPCR *NRAS Q61* Screening Kit**, includes 20x multiplex assay and 2x ddPCR supermix for probes (no dUTP)
12001094	**ddPCR *NRAS G12* Screening Kit**, includes 20x multiplex assay and 2x ddPCR supermix for probes (no dUTP)
12001627	**ddPCR *NRAS G12/G13* Screening Kit**, includes 20x multiplex assay and 2x ddPCR supermix for probes (no dUTP)

Thermal Cyclers for PCR

Instruments range from a personal thermal cycler to the flexible 1000-series. Multiple modules and chassis provide options for low- to high-throughput capabilities.

Learn More about the Technology
Web: bio-rad.com/tech/PCR

Thermal Cycler Selection Guide

Feature	**C1000 Touch**™ page 357	**S1000**™ page 358	**T100**™ page 360
Peltier-effect technology	•	•	•
Upgradable to real-time PCR	•		
Interchangeable sample blocks	•	•	
Number of wells	96, 96 deep, dual 48, or 384	96, 96 deep, dual 48, or 384	96
Gradient capability	•	•	•
Graphical user interface	•		•
Full-color display	•		•
Fast PCR protocol templates	•	•	•
Programmable ramp rates	•	•	•
Networking capability	•	•	
Heated lid	Adjustable	Adjustable	Fixed
USB flash drive compatibility	•		•

1000-Series Thermal Cyclers

Bio-Rad 1000-series thermal cyclers offer a fully modular platform. Choose the full-featured C1000 Touch™ cycler, the basic S1000™ cycler, or a combination of both. The cyclers can accommodate different throughput needs with easily interchangeable reaction blocks.

C1000 Touch™ Thermal Cycler

The C1000 Touch cycler is the flagship of the 1000-series thermal cycling platform, offering unmatched performance for fast, reliable results. The state-of-the-art interface allows new ways to optimize protocols and monitor runs.

Benefits include:

- Easily upgrade to real-time PCR using the CFX96™, CFX96 Touch™ Deep Well, or CFX384™ optical reaction module
- Save time creating and viewing protocols using the large color touch-screen display and intuitive graphical programming
- Email notification of run completion capability
- Back up your data and manage and transfer files using a USB flash drive
- Optional log-in, restricted user privileges, and secure mode for controlled environments and file protection

- Increase throughput simply and easily by connecting up to three additional S1000™ cyclers

For More Information
Web: bio-rad.com/C1000Touch
Request or download bulletins: 6085 and 6094

See Also

CFX96 Touch real-time PCR detection system: page 363.

CFX384 Touch real-time PCR detection system: page 365.

Ordering Information

Catalog #	Description
1841100	**C1000 Touch Thermal Cycler Chassis**, includes USB flash drive, power cord; does not include reaction module
1851148	**C1000 Touch Thermal Cycler with Dual 48/48 Fast Reaction Module**, includes C1000 Touch thermal cycler chassis, dual 48/48 fast reaction module, USB flash drive
1851196	**C1000 Touch Thermal Cycler with 96-Well Fast Reaction Module**, includes C1000 Touch thermal cycler chassis, 96-well fast reaction module, USB flash drive
1851197	**C1000 Touch Thermal Cycler with 96–Deep Well Reaction Module**, includes C1000 Touch thermal cycler chassis, 96–deep well reaction module, USB flash drive
1851138	**C1000 Touch Thermal Cycler with 384-Well Reaction Module**, includes C1000 Touch thermal cycler chassis, 384-well reaction module, USB flash drive

S1000™ Thermal Cycler

The S1000 thermal cycler can be used as a stand-alone, dependable instrument for PCR. Up to three S1000 cyclers can be connected to a C1000 Touch™ thermal cycler to form a high-throughput multi-bay instrument. The S1000 cycler offers the same thermal performance as the C1000 Touch cycler and lets you:

- Choose a reaction module that suits your needs — dual 48/48-well fast, 96-well fast, 96–deep well, or 384-well format
- Get optimal sealing using your favorite vessels and sealers with the redesigned, fully adjustable heated lid

For More Information
Web: bio-rad.com/S1000
Request or download bulletins: 6082 and 6094

Ordering Information

Catalog #	Description
1842000	**S1000 Thermal Cycler Chassis**, includes power cord; does not include reaction module
1852148	**S1000 Thermal Cycler with Dual 48/48 Fast Reaction Module**, includes S1000 thermal cycler chassis, dual 48/48 fast reaction module
1852196	**S1000 Thermal Cycler with 96-Well Fast Reaction Module**, includes S1000 thermal cycler chassis, 96-well fast reaction module
1852197	**S1000 Thermal Cycler with 96–Deep Well Reaction Module**, includes S1000 thermal cycler chassis, 96–deep well reaction module
1852138	**S1000 Thermal Cycler with 384-Well Reaction Module**, includes S1000 thermal cycler chassis, 384-well reaction module
Accessories	
1848000	**USB Cable**, for use with C1000, C1000 Touch, and S1000 thermal cyclers
1849000	**Tube Frame**, supports individual 0.2 ml tubes in the C1000, C1000 Touch, and S1000 dual 48- and 96-well reaction modules
1849001	**Tube Frame**, supports individual 0.2 ml tubes in the C1000 Touch and S1000 96–deep well reaction module
1849010	**Touch-Screen Protector**, for use with C1000 Touch thermal cycler, 2
1841001	**1000-Series Connectivity Kit**, includes mouse, mouse pad, USB key

Reaction Modules

Reaction Module Specifications



Reaction Module	96-Well Fast	96–Deep Well	Dual 48/48-Well Fast	384-Well
Sample capacity	96 x 0.2 ml tubes or 1 x 96-well plate	96 x 0.2 ml tubes, 48 x 0.5 ml tubes, or 1 x 96-well plate	2 x 48 x 0.2 ml tubes or 2 x 48-well plates	1 x 384-well plate
Maximum ramp rate	5°C/sec	2.5°C/sec	4°C/sec	2.5°C/sec
Temperature range	0–100°C	0–100°C	0–100°C	0–100°C
Temperature accuracy	±0.2°C of programmed target at 90°C	±0.2°C of programmed target at 90°C	±0.2°C of programmed target at 90°C	±0.2°C of programmed target at 90°C
Temperature uniformity	±0.4°C well-to-well within 10 sec of arrival at 90°C	±0.4°C well-to-well within 10 sec of arrival at 90°C	±0.4°C well-to-well within 10 sec of arrival at 90°C	±0.4°C well-to-well within 10 sec of arrival at 90°C

Thermal Gradient (available on all reaction modules)

Gradient range	30–100°C
Temperature differential range	1–24°C

Ordering Information

Catalog #	Description
1840148	**Dual 48/48 Fast Reaction Module**, independent dual 48-well reaction module, fits C1000, C1000 Touch, and S1000 thermal cyclers, gradient enabled
1840196	**96-Well Fast Reaction Module**, fits C1000, C1000 Touch, and S1000 thermal cyclers, gradient enabled
1840197	**96–Deep Well Reaction Module**, fits C1000, C1000 Touch, and S1000 thermal cyclers, gradient enabled
1840138	**384-Well Reaction Module**, fits C1000, C1000 Touch, and S1000 thermal cyclers, gradient enabled

Personal Thermal Cycler

See Also

PCR plastic consumables: page 387.

PCR reagents: page 372.

Nucleic acid sample preparation: page 9.

T100™ Thermal Cycler

The T100 thermal cycler is a compact, 96-well thermal cycler that offers a comprehensive package of features, including an easy-to-use touch screen, thermal gradient, and reliable performance.

With the T100 thermal cycler, you can:

- Save time programming with the intuitive touch screen
- Get superior results faster by optimizing your PCR assays in a single run using a thermal gradient
- Save valuable benchspace with the compact design
- Keep your protocols organized using personalized folders or a USB flash drive

For More Information
Web: bio-rad.com/T100
Request or download bulletin: 6065

Ordering Information

Catalog #	Description
1861096	**T100 Thermal Cycler**, includes 96-well thermal cycler, power cord, tube support ring
1862000	**Tube Support Ring**, extra tube support ring for use with individual tubes in the T100 thermal cycler, 2
1863000	**Touch-Screen Protector**, for use with T100 thermal cycler, 2
Recommended Consumables	
1708890	**iScript cDNA Synthesis Kit**, 25 x 20 µl reactions, includes 5x iScript reaction mix, iScript reverse transcriptase, nuclease-free water
1708896	**iScript Select cDNA Synthesis Kit**, 25 x 20 µl reactions, includes 5x iScript reaction mix, iScript reverse transcriptase, oligo(dT), random primer mix, gene specific primer enhancer solution, nuclease-free water
1708870	**iTaq DNA Polymerase**, 250 U (5 U/µl), includes 10x PCR buffer, 50 mM $MgCl_2$ solution
1725301	**iProof High-Fidelity DNA Polymerase**, 100 U (2 U/µl), includes 5x HF buffer, 5x GC buffer, 50 mM $MgCl_2$ solution, DMSO
HSS9601	**Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates**, clear shell, clear well, 25
MLP9601	**Multiplate High-Profile 96-Well Unskirted PCR Plates**, clear, 25
MSB1001	**Microseal 'B' Adhesive Seals**, optically clear, 100
TBS1201	**0.2 ml 12-Tube Strips without Caps**, clear, 100
TCS1201	**Domed 12-Cap Strips**, for 0.2 ml PCR tubes and plates, clear, 200
TWI0201	**0.2 ml PCR Tubes with Domed Caps**, clear, 1,000

Real-Time PCR Systems

Bio-Rad's real-time PCR detection systems are available as individual systems or as upgrades to Bio-Rad's C1000 Touch™ thermal cyclers. The detection systems' optical modules allow up to five-target sequence detection via fluorescence detection chemistry in a 96- or 384-well plate format.

All systems support integrated data analysis for PrimePCR™ disease and biological pathway panels as well as automated multiplate gene expression analysis, absolute quantification, copy number variation, and high resolution melt genotyping applications. See the selection guide below for comparative specifications.

Learn More about the Technology
Web: bio-rad.com/tech/qpcr

See Also

Total RNA extraction kits: page 9.
Experion system: page 267.
PCR reagents: page 372.
PrimePCR assays and panels: page 370.
PX1 PCR plate sealer: page 386.
PCR plastic consumables: page 387.

Real-Time PCR System Selection Guide




Feature	CFX Connect™	CFX96 Touch™	CFX96 Touch™ Deep Well	CFX384 Touch™
Base thermal cycler	CFX Connect	C1000 Touch	C1000 Touch	C1000 Touch
Sample capacity	96 wells	96 wells	96 wells	384 wells
Sample volume	Up to 50 µl	Up to 50 µl	Up to 125 µl	Up to 30 µl
Light source	3 filtered LEDs in optics shuttle	6 filtered LEDs in optics shuttle	6 filtered LEDs in optics shuttle	5 filtered LEDs in optics shuttle
Optical detection	3 photodiodes in optics shuttle	6 photodiodes in optics shuttle	6 photodiodes in optics shuttle	5 photodiodes in optics shuttle
Excitation range	450–535 nm	450–684 nm	450–684 nm	450–650 nm
Detection range*	515–580 nm	515–730 nm	515–730 nm	515–690 nm
Multiplex capability	Up to 2 targets	Up to 5 targets	Up to 5 targets	Up to 4 targets
FRET capability	•	•	•	•
Maximum ramp rate	5°C/sec	5°C/sec	2.5°C/sec	2.5°C/sec
Gradient capability	•	•	•	•
Gradient range	30–100°C	30–100°C	30–100°C	30–100°C
Maximum gradient span	24°C	24°C	24°C	24°C
CFX qualification plate	•	•	•	•

* Refer to system instruction manuals or bulletins 6093, 6096, and 6105 for information about useful detection ranges for specific dyes.

CFX Connect™ Real-Time PCR Detection System

The CFX Connect real-time PCR detection system offers two-target analysis in a 96-well format. The system incorporates innovative optical technologies with long-lasting LEDs and solid-state components to provide maximum reliability and flexibility. Included with the system is the powerful, easy-to-use CFX Manager™ software for system operation and data analysis.

- Save time and reduce costs by optimizing assays in a single run using the thermal gradient
- Quickly and accurately validate and analyze data with the advanced analysis modules of CFX Manager software
- Analyze data when and where you want by receiving email notification with an attached data file when a run is complete
- Increase throughput and flexibility by running up to 4 instruments from 1 computer

For More Information
Web: bio-rad.com/cfxconnect
Request or download bulletins: 6102, 6103, and 6105

Ordering Information

Catalog #	Description
1855200	**CFX Connect Real-Time PCR Detection System**, includes CFX Connect thermal cycler chassis, CFX Connect optical reaction module, CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1855201	**CFX Connect Real-Time PCR Detection System**, includes CFX Connect thermal cycler chassis, CFX Connect optical reaction module, CFX Manager software, license for qbase+ software, communication cable
Accessories	
1845098	**CFX Qualification Plate**, 96-well format, for use with CFX96, CFX96 Touch, CFX96 Touch Deep Well, or CFX Connect system, includes 1 predispensed plate containing supermix, primer mix, nuclease-free water
HSP9601	**Hard-Shell Low-Profile 96-Well Skirted PCR Plates**, white shell, clear well, 50
MSB1001	**Microseal 'B' Adhesive Seals**, optically clear, package of 100
1709799	**Real-Time PCR Applications Guide**
1814000	**PX1 PCR Plate Sealer**, includes heat sealing instrument, 96-well/384-well plate support block, sealing frame, power cord
1814030	**Optically Clear Heat Seal**, package of 100

CFX96 Touch™ Real-Time PCR Detection System

The CFX96 Touch real-time PCR detection system meets all your real-time PCR needs — whether you are running your first experiment or analyzing complex gene expression studies. With five-target detection, industry-leading stand-alone functionality, superior thermal cycler performance, and easy-to-use software, the CFX96 Touch system has been designed to advance your quantitative PCR (qPCR).

The CFX96 Touch real-time PCR detection system makes it easy to:

- Rapidly screen expression from a few to hundreds of genes with PrimePCR™ assay panels. Just drag and drop the run file to start runs with a single click
- Monitor amplification traces on the touch screen in real time. At run completion, automatically receive the data file for remote monitoring and data analysis
- Conserve your samples and reagents with true five-target multiplexing
- Expand your qPCR throughput with a simple upgrade to the CFX384™ optical reaction module
- Save time and reduce costs by optimizing assays in a single run using the thermal gradient

For More Information
Web: bio-rad.com/cfx96-pcr
Request or download bulletins: 6075, 6076, and 6093

Ordering Information

Catalog #	Description
1845096*	**CFX96 Optical Reaction Module for Real-Time PCR Systems with Starter Package**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1845097*	**CFX96 Optical Reaction Module for Real-Time PCR Systems**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase+ software, communication cable
1855196	**CFX96 Touch Real-Time PCR Detection System with Starter Package**, includes C1000 Touch thermal cycler chassis, CFX96 optical reaction module, CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1855195	**CFX96 Touch Real-Time PCR Detection System**, includes C1000 Touch thermal cycler chassis, CFX96 optical reaction module, CFX Manager software, license for qbase+ software, communication cable
Accessories	
1845098	**CFX Qualification Plate**, 96-well format, for use with CFX96, CFX96 Touch, CFX96 Touch deep well, or CFX Connect system, includes 1 predispensed plate containing supermix, primer mix, nuclease-free water
TLS0801	**Low-Profile 8-Tube Strips without Caps (0.2 ml)**, clear, 120 strips (960 tubes)
TCS0803	**Optical Flat 8-Cap Strips**, for 0.2 ml PCR tubes and plates, ultraclear, 120
HSP9601	**Hard-Shell Low-Profile 96-Well Skirted PCR Plates**, white shell, clear well, 50
MSB1001	**Microseal 'B' Adhesive Seals**, optically clear, package of 100
1709799	**Real-Time PCR Applications Guide**
1814000	**PX1 PCR Plate Sealer**, includes heat sealing instrument, 96-well/384-well plate support block, sealing frame, power cord
1814030	**Optically Clear Heat Seal**, package of 100

* Order to upgrade an existing C1000 or C1000 Touch thermal cycler.

CFX96 Touch™ Deep Well Real-Time PCR Detection System

The CFX96 Touch deep well real-time PCR detection system offers precise quantification and target discrimination for up to five targets in large reaction volumes. The system incorporates industry-leading technology to provide robust and reliable results.

The CFX96 Touch deep well real-time PCR detection system makes it easy to:

- Use reaction volumes up to 125 µl
- Rapidly screen expression from a few to hundreds of genes with PrimePCR™ assay panels. Just drag and drop the run file to start runs with a single click
- Monitor amplification traces on the touch screen in real time. At run completion, automatically receive the data file for remote monitoring and data analysis
- Conserve your samples and reagents with true five-target multiplexing
- Save time and reduce costs by optimizing assays in a single run using the thermal gradient

For More Information
Web: bio-rad.com/CFX96DeepWell
Request or download bulletins: 6238 and 6243

Ordering Information

Catalog #	Description
1844096*	**CFX96 Deep Well Optical Reaction Module for Real-Time PCR Systems with Starter Package**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1844095*	**CFX96 Deep Well Optical Reaction Module for Real-Time PCR Systems**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase+ software, communication cable
1854096	**CFX96 Touch Deep Well Real-Time PCR Detection System with Starter Package**, includes C1000 Touch thermal cycler chassis, CFX96 deep well optical module, CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1854095	**CFX96 Touch Deep Well Real-Time PCR Detection System**, includes C1000 Touch thermal cycler chassis, CFX96 deep well optical module, CFX Manager software, license for qbase+ software, communication cable
Accessories	
1845098	**CFX Qualification Plate**, 96-well format, for use with CFX96, CFX96 Touch, CFX96 Touch deep well, or CFX Connect system, includes 1 predispensed plate containing supermix, primer mix, nuclease-free water
TLS0801	**Low-Profile 8-Tube Strips without Caps (0.2 ml)**, clear, 120 strips (960 tubes)
TCS0803	**Optical Flat 8-Cap Strips**, for 0.2 ml PCR tubes and plates, ultraclear, 120
HSP9601	**Hard-Shell Low-Profile 96-Well Skirted PCR Plates**, white shell, clear well, 50
MSB1001	**Microseal 'B' Adhesive Seals**, optically clear, package of 100
1709799	**Real-Time PCR Applications Guide**
1814000	**PX1 PCR Plate Sealer**, includes heat sealing instrument, 96-well/384-well plate support block, sealing frame, power cord
1814030	**Optically Clear Heat Seal**, package of 100

* Order to upgrade an existing C1000 or C1000 Touch thermal cycler.

CFX384 Touch™ Real-Time PCR Detection System

The CFX384 Touch real-time PCR detection system brings flexibility and ease of use to researchers performing high-throughput real-time PCR in a 384-well format. With the ability to run without a computer, superior performance, and powerful yet easy-to-use software, the CFX384 Touch system has been designed to advance your qPCR.

The CFX384 Touch real-time PCR detection system makes it easy to:

- Rapidly screen expression of hundreds of genes with PrimePCR™ assay panels. Just drag and drop the run file to start runs with a single click
- Verify the performance of your CFX real-time PCR detection system using the CFX qualification plate, system test software, IQ/OQ, and automated data quality control
- Integrate a laboratory information management system (LIMS) using built-in LIMS file management
- Combine the CFX384 Touch system with good laboratory practice standards by using CFX Manager™ software, Security Edition, which complies with U.S. FDA 21 CFR Part 11 regulations, for data collection and analysis

For More Information
Web: bio-rad.com/cfx384-pcr
Request or download bulletins: 6072, 6077, and 6096

Ordering Information

Catalog #	Description
1845384*	**CFX384 Optical Reaction Module for Real-Time PCR Systems with Starter Package**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1845385*	**CFX384 Optical Reaction Module for Real-Time PCR Systems**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase+ software, communication cable
1855484	**CFX384 Touch Real-Time PCR Detection System with Starter Package**, includes C1000 Touch thermal cycler chassis, CFX384 optical reaction module, CFX Manager software, license for qbase+ software, communication cable, reagents, consumables
1855485	**CFX384 Touch Real-Time PCR Detection System**, includes C1000 Touch thermal cycler chassis, CFX384 optical reaction module, CFX Manager software, license for qbase+ software, communication cable
Accessories	
1845099	**CFX Qualification Plate**, 384-well format, for use with CFX384 or CFX384 Touch system, includes 1 predispensed plate containing supermix, primer mix, nuclease-free water
HSP3805	**Hard-Shell 384-Well Standard PCR Plates**, clear shell, white well, 50
MSB1001	**Microseal 'B' Adhesive Seals**, optically clear, package of 100
1709799	**Real-Time PCR Applications Guide**
1814000	**PX1 PCR Plate Sealer**, includes heat sealing instrument, 96-well/384-well plate support block, sealing frame, power cord
1814030	**Optically Clear Heat Seal**, package of 100

* Order to upgrade an existing C1000 or C1000 Touch thermal cycler.

See Also

PrimePCR assays and panels: page 370.

CFX qualification plate: page 367.

CFX Automation System II

The CFX automation system II is ideally suited to meet the high-throughput PCR requirements of today's drug discovery and screening workflows. It works with up to two CFX real-time PCR detection systems to enable walk-away, high-throughput quantitative PCR (qPCR) operation. Each rack can hold up to forty-eight 384-well PCR plates or thirty-two 96-well plates, facilitating the generation of large volumes of data and rapid data analysis. The software is designed to work seamlessly with CFX systems, eliminating the need for automation system expertise. Powerful software features enable the pairing of cycling information with specific barcoded plates and the direct importing of barcode information from laboratory information management systems (LIMS). The intuitive calibration wizard makes it simple to add CFX systems at any point or recalibrate the automation system when required.

The CFX automation system II makes it easy to:

- **Save valuable laboratory space** — a single plate handler can service 2 CFX systems in a compact footprint
- **Meet changing throughput demands** — scalable design enables beginning with 1 CFX system and adding another CFX system when required
- **Stay organized** — track samples using the barcode reader and integrate with LIMS
- **Save time** — seamless software integration with PrimePCR™ assays minimizes time-consuming setup and analysis
- **Analyze data when and where you want** — receive email notification with an attached data file at the completion of each run

For More Information
Web: bio-rad.com/automation
Request or download bulletins: 6626 and 6629

Ordering Information

Catalog #	Description
1845075	**CFX Automation System II for Real-Time PCR Systems**, includes plate handler and barcode scanner, mounting plate, automation software; does not include CFX real-time PCR detection system

PCR Instrument Validation Tool

Bio-Rad's PCR instrument validation tool allows you to easily test the performance of your real-time PCR system.

Instrument Validation Tool

	CFX Connect™	CFX96 Touch™	CFX96 Touch™ Deep Well	CFX384 Touch™
CFX qualification plate	•	•	•	•

CFX Qualification Plate

The CFX qualification plate is an easy-to-use tool for validating the performance of your CFX system. The plate is predispensed with an optimized assay, supermix, and nuclease-free water. The CFX qualification plate can be incorporated into an instrument qualification procedure for easy tracking of your instrument's performance. Features include:

- 2-fold discrimination with 99.7% confidence level
- Predefined thermal cycling protocol and plate templates for a streamlined workflow
- Ability to generate a full PDF report with CFX Manager™ software

For More Information
Web: bio-rad.com/cfxqualification
Request or download bulletin: 6323

Ordering Information

Catalog #	Description
1845098	**CFX Qualification Plate**, 96-well format, for use with CFX96, CFX96 Touch, CFX96 Touch deep well, or CFX Connect system, includes 1 predispensed plate containing supermix, primer mix, nuclease-free water
1845099	**CFX Qualification Plate**, 384-well format, for use with CFX384 or CFX384 Touch system, includes 1 predispensed plate containing supermix, primer mix, nuclease-free water

PCR and Real-Time PCR Software

Bio-Rad PCR and real-time software supports multi-instrument control and collection and analysis of real-time PCR data. Probe and primer design software enables rapid design of robust real-time PCR assays.

Amplification Software System Requirements

	Minimum	Recommended
Operating system	Windows XP Professional SP2, Windows 7	Windows XP Professional SP3, Windows 7, Windows 8
Processor	1 GHz	2 GHz
RAM	1 GB (2 GB for Windows 7)	2 GB
Hard drive space	10 GB	20 GB
Screen resolution	1,024 x 768 with true-color mode	1,280 x 1,024 with true-color mode
Drive	CD-ROM	CD-RW
USB port	2.0 Hi-Speed	2.0 Hi-Speed

CFX Manager™ Software

CFX Manager software sets the standard for real-time data acquisition and analysis. This version supports the CFX96 Touch™, CFX96 Touch™ Deep Well, CFX Connect™, and CFX384 Touch™ real-time PCR detection systems. Bio-Rad® PrimePCR™ assay users will benefit from full software integration, from one-click run start to automated data analysis. The software enables you to:

- Get started quickly using the Startup Wizard
- Analyze your results when and where you want following email notification with an attached data file when a run is complete
- Run a wide range of applications such as relative gene expression, genotyping, absolute quantification, and more
- Make faster data-driven decisions by easily visualizing all your important run data in a single window using Custom Data View
- Extract more meaningful information from each run using analyses such as volcano plots, which emphasize statistically significant targets, and clustergrams, which arrange samples and targets into groups of similar expression
- Export only the data you want in your preferred format with Custom Data Export

For More Information
Web: bio-rad.com/cfx-manager-software

Ordering Information

Catalog #	Description
1845000	**CFX Manager Software**, includes installation CD, quick guides, instruction manual

CFX Manager™ Software, Security Edition

CFX Manager software, Security Edition provides important tools for compliance with U.S. FDA 21 CFR Part 11 regulations. The Security Edition requires a valid Windows XP, Windows 7, or Windows 8 username and password for login. The software requires a hardware protection key to be attached to a USB port on the computer, uses file encryption to ensure files cannot be opened or edited using other programs, and allows multiple electronic signatures. The software ensures that integrity and validity are checked each time a file is opened with automatic file checking and allows read-only information displayed in the time- and date-stamped audit trail to be viewed only while the data file of interest is open.

For More Information
Web: bio-rad.com/cfx-manager-software-security-edition
Request or download bulletin: 5690

Ordering Information

Catalog #	Description
1845001	**CFX Manager Software, Security Edition**, includes 1 user license, installation CD, HASP HL key
1845005	**CFX Manager Software, Security Edition**, includes 5 user licenses, 5 installation CDs, 5 HASP HL keys
1845010	**CFX Manager Software, Security Edition**, includes 10 user licenses, 10 installation CDs, 10 HASP HL keys

CFX Manager™ Software, Chinese and Russian Editions

CFX Manager software Chinese and Russian Editions work with the regional settings of the Windows XP, Windows 7, and Windows 8 operating systems to provide localized, language-specific environments. The Chinese and Russian Editions also provide hardware protection to CFX Manager software: a HASP hardware license (HL)-based key must be attached to a USB port on the computer to use the software in regional language mode.

For More Information
Web: bio-rad.com/cfx-manager-software-chinese-edition; bio-rad.com/cfx-manager-software-russian-edition

Ordering Information

Catalog #	Description
1845008	**CFX Manager Software, Chinese Edition**, includes 3 user licenses, installation CD, 3 HASP HL keys
1845028	**CFX Manager Software, Russian Edition**, includes 3 user licenses, installation CD, 3 HASP HL keys

Precision Melt Analysis™ Software

Precision Melt Analysis software imports and analyzes data files generated from the CFX96 Touch™, CFX96 Touch™ Deep Well, CFX384 Touch™, or CFX Connect™ real-time PCR detection systems to genotype samples based on the thermal denaturation properties of double-stranded DNA. The software can be used for a variety of genotyping applications, including scanning for new gene variants, screening DNA samples for SNPs, identifying insertions/deletions or other unknown mutations, and determining the percentage of methylated DNA in unknown samples. The software enables you to:

- Assign sample genotypes automatically based on cluster analysis or manually using multiple data view options to tailor the software to the appropriate analysis
- Generate a basic representation of the different clusters based on curve shifting (homozygotes) and curve shape change (heterozygotes) using the normalized melt curves plot feature
- Compare data between multiple file runs by combining them into a single melt study — develop a standard library of melt curve runs to analyze an unlimited number of melt experiments without having to export data
- View multiple displays of the data, including a simultaneous display of the original melt curves and the normalized plot
- Export data to multiple formats, including spreadsheet, image, XML, and HTML files
- Analyze multiple experiments from a single plate using the Well Groups feature
- Arrange melt data or melt study data into a customizable report

For More Information
Web: bio-rad.com/precision-melt-analysis-software
Request or download bulletin: 5798

Ordering Information

Catalog #	Description
1845025	**Precision Melt Analysis Software**, includes 2 user licenses, installation CD, 2 HASP HL keys, melt calibration kit
1845015	**Precision Melt Analysis Software Only**, includes 2 user licenses, installation CD, 2 HASP HL keys
1845020	**Melt Calibration Kit**, includes melt calibration DNA standard, melt primers, precision melt supermix

Gene Expression Assays and PCR Arrays

PrimePCR™ assays and arrays for real-time PCR are wet-lab validated or expertly designed to ensure optimal assay performance and compliance with the minimum information for publication of quantitative real-time PCR experiments (MIQE) guidelines (Bustin et al. 2009).

See Also

iScript advanced cDNA synthesis kit for RT-qPCR: page 383.

SsoAdvanced™ universal SYBR® Green supermix: page 373.

SsoAdvanced universal probes supermix: page 374.

PrimePCR™ Assays and Panels

Wet-Lab Validated or Expertly Designed for Guaranteed Performance

Every gene expression assay for human, mouse, and rat has been wet-lab validated to meet stringent performance standards, providing confidence in results while eliminating time-consuming assay design and optimization. The assay design algorithm that was optimized during the wet-lab validation process has been used to expertly design assays for nine additional genomes that are guaranteed to perform.

Wet-Lab Validation of Every Primer Pair

Wide Range of Predesigned Disease- and Pathway-Specific Panels

Complete Solution for Real-Time PCR

Expert Design for All Assays

Design Parameter	Why It Matters
Maximum transcript coverage	Not detecting the maximum number of transcripts underrepresents expression of target
Intron-spanning assay design when possible	Genomic DNA amplification can lead to false-positive results, which is problematic when checking for small changes in gene expression
Secondary structure avoided	Secondary structure can impede polymerase activity and reduce PCR efficiency
Single nucleotide polymorphisms (SNPs) avoided	SNPs destabilize binding; mismatching results in reduced PCR efficiency, delayed shift in quantification cycle (Cq), and underestimation of gene expression
Specific sequences identified (specificity)	Coamplification of off-target sequences can cause high PCR efficiency and/or false-positive signals
Universal assay conditions tested	Assays work on any instrument with any protocol
Latest genome information used	Assays designed with old bioinformatics will not reflect the latest information on SNP location, transcripts, and pseudogenes, resulting in assays that can provide incorrect gene expression

Wet-Lab Validation for Human, Mouse, and Rat Assays

Design Parameter	Why It Matters
Specificity	Validation with next-generation sequencing and melt curve analysis prevents coamplification of off-target sequences that could cause high PCR efficiency and/or false-positive signals
Sensitivity/dynamic range	Not understanding the detection limits of the assay could lead to high PCR efficiency and/or false-positive signals
R^2 value	Without a good R^2 value, the Cq value will not be a reliable way to calculate the expression
Efficiency	High or low efficiency could cause misrepresentation of gene expression data

PrimePCR Genome and Product Summary

	Expertly Designed, Wet-Lab Validated	Expertly Designed Genomes
	Human, Mouse, and Rat	Rhesus Monkey, Yeast, Zebrafish, Cow, Pig, Rabbit, Dog, Chicken, and *Arabidopsis*
SYBR® Green and probe assays	•	•
PreAmp assays	•	•
Pathway, collection, disease, and SABiosciences PCR arrays	•	
Custom plates	•	•
Control assays	•	•
Reference gene assays	•	•
Reference gene panels	•	

Wide Range of Pathway and Collection PCR Arrays
Predesigned plates are available for signaling and disease pathways to help identify and investigate key targets in a biological pathway of interest. Predesigned plates can be modified to include user-selected assays.

Customizable 96- and 384-Well Plate Formats
Easy-to-use custom plate configurator allows users to lay out assays on a plate exactly as they choose.

Fully Integrated with CFX Manager™ Software
Full integration with CFX real-time PCR systems and data analysis software streamlines data collection and analysis.

The PrimePCR qPCR product family includes:

- **Predesigned primer assays** — genome-wide assays for SYBR® Green gene expression analysis available in 200, 1,000, and 2,500 reactions
- **Predesigned probe assays** — genome-wide 5' nuclease probe assays for gene expression analysis available in 500, 1,000, and 2,500 reactions
- **Custom assays** — order your primer and probe sequences of interest, available in 200, 500, 1,000, and 2,500 reactions
- **Custom PCR plates** — custom-configured 96- and 384-well PCR plates
- **Pathway and collection PCR arrays** — predesigned 96- and 384-well PCR pathway and collection panels
- **DNA templates** — synthetic DNA templates can be used as a positive control for the corresponding gene-specific assay
- **Experimental controls** — control assays are available for reverse transcription, RNA quality, genomic DNA contamination, and PCR performance
- **Reference gene assays** — commonly used reference gene assays are available to normalize for variation in the amount of input mRNA among samples
- **PreAmp assays** — assays for the unbiased, target-specific preamplification of up to 100 gene targets in a single reaction

PrimePCR assays are also available for Droplet Digital™ PCR. Please see page 355 for more information.

For More Information
Web: bio-rad.com/PrimePCR
Download bulletins: 6262, 6263, and 6290

PCR and Real-Time PCR Reagents

PCR reagents, such as ready-to-use 2x supermixes and cDNA synthesis kits, are optimized for PCR, reverse transcription (RT), or quantitative PCR (qPCR) applications, including high resolution melt (HRM) analysis and long, proofreading, and fast PCR.

Real-Time PCR Supermixes and Kits

Ready-to-use 2x supermixes are suitable for use in real-time PCR and are tested for reliable amplification over a wide dynamic range of input template: genomic DNA (gDNA), complementary DNA (cDNA), and plasmid DNA (pDNA).

For More Information
Web: bio-rad.com/supermixes

Reagent Compatibility with Instruments

	SYBR® Green Supermixes				Probes Supermixes				One-Step Kits for RT-qPCR	
Real-Time qPCR Instrument	SsoAdvanced™ Universal SYBR® Green Supermix	iTaq™ Universal SYBR® Green Supermix	SsoAdvanced™ Universal Inhibitor Tolerant SYBR® Green Supermix	iQ™ SYBR® Green Supermix	SsoAdvanced Universal Probes Supermix	iTaq Universal Probes Supermix	iQ Supermix	iQ Multiplex Powermix	iTaq™ Universal SYBR® Green One-Step Kit	iTaq Universal Probes One-Step Kit
Bio-Rad										
CFX96™, CFX96 Touch™, CFX384™, CFX384 Touch™, CFX Connect™	•	•	•	•	•	•	•	•	•	•
iQ™, iQ™5, MyiQ™, MyiQ™2	•	•	•	•	•	•	•	•	•	•
MiniOpticon™, DNA Engine Opticon® 1 and 2	•	•	•	•	•	•	•	•	•	•
Applied Biosystems										
StepOne/StepOne Plus	•	•	•	◆	•	•	◆	◆	•	•
7000, 7300, 7500, 7700, 7900HT, ViiA 7, QuantStudio (all systems)	•	•	•	—	•	•	—	—	•	•
Stratagene										
Mx3000P, 3005P, 4000	•	•	•	•	•	•	•	•	•	•
Eppendorf										
Mastercycler ep *realplex* 2 or 4	•	•	•	•	•	•	•	•	•	•
QIAGEN/Corbett										
Rotor-Gene 3000, 6000, Q	•	•	•	•	•	•	•	•	•	•
Roche										
LightCycler 480	•	•	•	•	•	•	•	•	•	•
LightCycler 96	•	•	•	•	•	•	•	•	•	•
LightCycler 1.0, 1.5, 2.0	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Illumina										
Eco	•	•	•	•	•	•	•	•	•	•
Thermo Scientific										
PikoReal	•	•	•	•	•	•	•	•	•	•
Idaho Technology										
LightScanner HR-1	•	•	•	•	•	•	•	•	•	•
LightScanner 32	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲

• Recommended for use as is; ◆ ROX reference setting must be turned "off"; ▲ BSA must be added according to instrument specifications

Use this selection guide to choose an appropriate reagent for your application.



Feature	SsoAdvanced™ Universal Supermixes	iTaq™ Universal Supermixes	iQ™ Supermixes
Sensitive detection of low-level target genes	•••	•••	••
Efficiency with difficult target sequences	•••	••	••
Priming specificity	•••	••	•
Tolerance to PCR inhibitors	•••	—	—
Broad range of reaction conditions	•••	••	•
Fast cycling	•••	•••	•
Instrument compatibility	Any instrument	Any instrument	Select instruments

••• Excellent •• Good • Fair

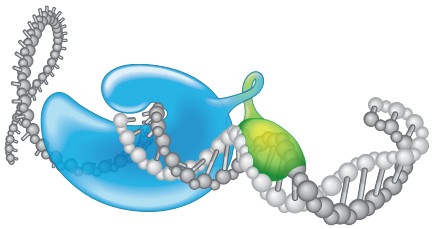
SsoAdvanced™ Universal SYBR® Green Supermix

SsoAdvanced™ universal SYBR® Green supermix is a high-performance real-time PCR supermix based on Bio-Rad's patented* Sso7d fusion protein technology. This supermix is formulated for a wide range of real-time PCR applications and for use with all ROX dependent or independent real-time PCR systems. The dsDNA binding protein, Sso7d, stabilizes the polymerase-template complex, providing superior inhibitor tolerance, increased processivity, specificity, and greater speed while enhancing PCR sensitivity, efficiency, or reproducibility.

SsoAdvanced™ universal SYBR® Green supermix lets you:

- **Increase your qPCR sensitivity and efficiency of detection from compromised samples** — Sso7d fusion polymerase has increased resistance to a wide variety of PCR inhibitors, providing better sensitivity and overall performance
- **Achieve superior real-time PCR results under any condition** — robust formulation delivers consistent performance in fast cycling across a broad range of reaction conditions, primer concentrations, and temperature ranges
- **Decrease time to results without compromising qPCR data quality** — Sso7d fusion polymerase and optimized buffer together provide rapid polymerization kinetics and instant polymerase activation
- **Use any real-time PCR system** — the universal reference dye in this supermix enables ROX normalization of qPCR data regardless of the ROX level requirements of the qPCR system
- **Obtain better results with PrimePCR™ assays** — real-time PCR assays are expertly designed and wet-lab validated to ensure optimal assay performance

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.



The dsDNA binding protein, Sso7d, stabilizes the polymerase-template complex, increases processivity, and provides greater speed and reduced reaction times compared to traditional DNA polymerases. Sso7d fusion polymerases are significantly more resistant to PCR inhibitors, making the SsoAdvanced supermixes ideal choices for challenging applications, such as direct qPCR, without the need for sample preparation.

Applications and Uses of SsoAdvanced™ Universal SYBR® Green Supermix

- Real-time PCR
- Gene expression analysis
- Pathway analysis
- Absolute quantification
- Mutation detection
- Pathogen detection
- Characterization of genetically modified organisms (GMO)
- Genetic profiling

Instrument Compatibility

The SsoAdvanced universal SYBR® Green supermix is compatible with all commercially available and all Bio-Rad real-time qPCR systems.

For More Information

Web: bio-rad.com/supermixes
View the Universal Real-Time PCR Reagents Web App:
bio-rad.com/App/UniversalSupermixes

View the Understanding Real-Time PCR Supermixes Tutorial:
bio-rad.com/supermixes_tutorial

Ordering Information

Catalog #	Description
1725270	**SsoAdvanced Universal SYBR Green Supermix**, 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725271	**SsoAdvanced Universal SYBR Green Supermix**, 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725272	**SsoAdvanced Universal SYBR Green Supermix**, 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725274	**SsoAdvanced Universal SYBR Green Supermix**, 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725275	**SsoAdvanced Universal SYBR Green Supermix**, 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions

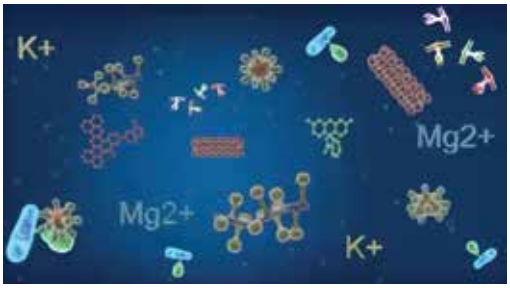
SsoAdvanced™ Universal Probes Supermix

SsoAdvanced universal probes supermix is a high-performance real-time PCR supermix based on Bio-Rad's patented* Sso7d fusion protein technology. This supermix is formulated for a wide range of real-time PCR applications and for use with all ROX dependent or independent real-time PCR systems. The dsDNA binding protein, Sso7d, stabilizes the polymerase-template complex, providing superior inhibitor tolerance, increased processivity, better specificity, and greater speed while enhancing PCR sensitivity, efficiency, or reproducibility.

SsoAdvanced universal probes supermix lets you:

- **Increase your qPCR sensitivity and efficiency of detection from compromised samples** — Sso7d fusion polymerase has increased resistance to a wide variety of PCR inhibitors, providing better sensitivity and overall performance
- **Achieve superior real-time PCR results under any condition** — robust formulation delivers consistent performance in fast cycling across a broad range of reaction conditions, primer concentrations, and temperature ranges
- **Carry out high-performance singleplex and multiplex reactions** — Sso7d fusion polymerase and advanced formulation enable robust performance in singleplex or multiplex real-time PCR reactions, providing the highest data precision and allowing cost and time savings when combining 2 assays in a single well
- **Decrease time to results without compromising qPCR data quality** — Sso7d fusion polymerase and optimized buffer together provide rapid polymerization kinetics and instant polymerase activation
- **Use any real-time PCR system** — the universal reference dye in this supermix enables ROX normalization of qPCR data regardless of the ROX level requirements of the qPCR system

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.



Robust formulation containing advanced components delivers superior and consistent performance in standard and fast cycling conditions across a broad range of reaction conditions, primer concentrations, and temperature ranges.

Applications and Uses of SsoAdvanced Universal Probes Supermix

- Real-time PCR
- Gene expression analysis
- Absolute quantification
- Multiplexing
- Genotyping (allelic discrimination)
- Mutation detection
- Pathogen detection
- Characterization of GMOs
- Genetic profiling

Instrument Compatibility

The SsoAdvanced universal probes supermix is compatible with all commercially available and all Bio-Rad real-time qPCR systems.

For More Information

Web: bio-rad.com/supermixes
View the Universal Real-Time PCR Reagents Web App: bio-rad.com/App/UniversalSupermixes

View the Understanding Real-Time PCR Supermixes Tutorial: bio-rad.com/supermixes_tutorial

Ordering Information

Catalog #	Description
1725280	**SsoAdvanced Universal Probes Supermix**, 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725281	**SsoAdvanced Universal Probes Supermix**, 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725282	**SsoAdvanced Universal Probes Supermix**, 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725284	**SsoAdvanced Universal Probes Supermix**, 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725285	**SsoAdvanced Universal Probes Supermix**, 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions

iTaq™ Universal Supermixes

iTaq universal supermix is a 2x concentrated, ready-to-use supermix formulated to deliver robust qPCR results with superior sensitivity, efficiency, and specificity. This supermix is available with SYBR® Green or probe-based chemistries.

Features and benefits include:

- Advanced buffer formulation developed for optimal qPCR results with SYBR® Green or fluorogenic probe (simplex and duplex)
- Antibody-mediated hot-start iTaq DNA polymerase for fast activation and superior specificity
- Optimized for consistent results using both standard and fast cycling protocols
- Blend of reference dyes for universal real-time PCR instrument compatibility

Instrument Compatibility

The iTaq™ universal SYBR® Green supermix and probes supermix are compatible with all commercially available and all Bio-Rad real-time qPCR systems.

For More Information

Web: bio-rad.com/supermixes
View the Universal Real-Time PCR Reagents Web App: bio-rad.com/App/UniversalSupermixes

View the Understanding Real-Time PCR Supermixes Tutorial: bio-rad.com/supermixes_tutorial

Ordering Information

Catalog #	Description
1725120	**iTaq Universal SYBR Green Supermix**, 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725121	**iTaq Universal SYBR Green Supermix**, 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725122	**iTaq Universal SYBR Green Supermix**, 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725124	**iTaq Universal SYBR Green Supermix**, 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725125	**iTaq Universal SYBR Green Supermix**, 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions
1725130	**iTaq Universal Probes Supermix**, 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725131	**iTaq Universal Probes Supermix**, 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725132	**iTaq Universal Probes Supermix**, 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725134	**iTaq Universal Probes Supermix**, 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725135	**iTaq Universal Probes Supermix**, 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions

SsoAdvanced™ Universal Inhibitor-Tolerant SYBR® Green Supermix

SsoAdvanced™ universal inhibitor-tolerant SYBR® Green supermix is a high-performance real-time PCR supermix based on Bio-Rad's patented* Sso7d fusion protein technology. This supermix is specifically formulated for use with difficult target sequences in a wide range of challenging sample types including crude lysates. The dsDNA binding protein, Sso7d, stabilizes the polymerase-template complex, providing superior PCR inhibitor tolerance, increased processivity and specificity, and greater speed while enhancing PCR sensitivity, efficiency, or reproducibility.

- **Skip RNA and DNA extraction by using crude samples** — superior data using crude lysates from plants, seeds, cells, bacteria, or FFPE samples
- **Power through PCR inhibitors** — unrivaled performance with common PCR inhibitors, such as heparin, polysaccharides, and culture media
- **Obtain high-quality data with fast cycling across a broad range of conditions** — optimal results over wide variations in reaction conditions, primer concentrations, and temperatures

- **Rapid polymerization kinetics and instant polymerase activation** — decrease time to results without compromising real-time quantitative PCR (RT-qPCR) data quality
- **Obtain better results with Bio-Rad's PrimePCR™ assays** — real-time PCR assays are expertly designed and wet-lab validated to ensure optimal assay performance
- **Increase cDNA loading** — add up to 20% cDNA from our iScript™ advanced cDNA synthesis kit for RT-qPCR or iScript reverse transcription supermix for RT-qPCR
- **Use with any real-time PCR system**

For More Information
Web: bio-rad.com/SUIT

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.

Ordering Information

Catalog #	Description
1725016	**SsoAdvanced Universal Inhibitor-Tolerant SYBR Green Supermix**, 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725017	**SsoAdvanced Universal Inhibitor-Tolerant SYBR Green Supermix**, 5 ml (1 x 5 ml vial), 500 x 20 µl reactions
1725018	**SsoAdvanced Universal Inhibitor-Tolerant SYBR Green Supermix**, 10 ml (2 x 5 ml vials), 1,000 x 20 µl reactions

iQ™ Supermixes

iQ™ SYBR® Green Supermix

- Analysis of low-, medium-, and high-abundance target genes with superior sensitivity and efficiency
- Formulated for maximum SYBR® Green I stability and performance in a wide variety of real-time PCR instruments
- Antibody-mediated hot-start polymerase for quick activation and increased specificity

iQ Supermix

- Maximum efficiency and sensitivity for qPCR using fluorogenic probes
- Reliable quantification of up to 2 targets over a wide dynamic range of human gDNA and pDNA concentrations
- Contains antibody-mediated hot-start iTaq™ DNA polymerase for quick activation and increased specificity

iQ Multiplex Powermix

- Robust supermix formulated for sensitive and efficient multiplex qPCR
- Reliable quantification of up to 4 targets (when there is up to 10^6-fold difference in expession levels between target genes) or up to 5 targets
- Linearity over 6 orders of magnitude of input cDNA and 4 orders of magnitude of input gDNA
- Suitable for a wide variety of applications, including gene expression analysis, single nucleotide polymorphism (SNP) genotyping, SNP analysis, GMO detection, and viral load detection

For More Information
Request or download bulletin: 6090

Ordering Information

Catalog #	Description
1708880	**iQ SYBR Green Supermix**, 2.5 ml (2 x 1.25 ml vials), 100 x 50 µl reactions
1708882	**iQ SYBR Green Supermix**, 12.5 ml (10 x 1.25 ml vials), 500 x 50 µl reactions
1708884	**iQ SYBR Green Supermix**, 25 ml (20 x 1.25 ml vials), 1,000 x 50 µl reactions
1708885	**iQ SYBR Green Supermix**, 50 ml (50 ml bottle), 2,000 x 50 µl reactions
1708886	**iQ SYBR Green Supermix**, 25 ml (5 x 5 ml vials), 1,000 x 50 µl reactions
1708887	**iQ SYBR Green Supermix**, 50 ml (10 x 5 ml vials), 2,000 x 50 µl reactions
1708860	**iQ Supermix**, 2.5 ml (2 x 1.25 ml vials), 100 x 50 µl reactions
1708862	**iQ Supermix**, 12.5 ml (10 x 1.25 ml vials), 500 x 50 µl reactions
1708864	**iQ Supermix**, 25 ml (20 x 1.25 ml vials), 1,000 x 50 µl reactions
1725848	**iQ Multiplex Powermix**, 1.25 ml (1 x 1.25 ml vial), 50 x 50 µl reactions
1725849	**iQ Multiplex Powermix**, 5 ml (4 x 1.25 ml vials), 200 x 50 µl reactions

See Also
PCR plastic consumables: page 387.

iTaq™ Universal SYBR® Green One-Step Kit

The iTaq™ Universal SYBR® Green One-Step Kit is a fast and convenient solution for real-time PCR using the powerful combination of RNase H+ MMLV reverse transcriptase, specificity enhancer, and hot-start iTaq DNA polymerase in one fast reaction. It provides improved PCR efficiency, wider dynamic range, superior sensitivity and better specificity, and inhibitor tolerance without affecting performance, even with cell lysates.

- **Increase sensitivity, specificity, and efficiency** — advanced formulation enables robust performance with a wide variety of sample types and target sequences
- **Use any real-time PCR system** — the universal reference dye in this reaction mix enables ROX normalization of qPCR data regardless of the ROX level requirements of the qPCR system
- **Achieve superior real-time PCR results under most conditions** — robust formulation delivers consistent performance in fast cycling across a broad range of reaction conditions, primer concentrations, and temperature ranges
- **Obtain better results with PrimePCR™ assays** — real-time PCR assays are expertly designed and wet-lab validated to ensure optimal assay performance

Applications and Uses of iTaq™ Universal SYBR® Green One-Step Kit

- Real-time PCR
- Gene expression analysis
- Absolute quantification
- Pathogen/virus detection

Instrument Compatibility

The iTaq™ universal SYBR® Green one-step kit is compatible with Bio-Rad's and all other commercially available real-time qPCR systems.

For More Information
Web: bio-rad.com/supermixes
View the Universal Real-Time PCR Reagents Web App: bio-rad.com/App/UniversalSupermixes

Ordering Information

Catalog #	Description
iTaq Universal SYBR Green One-Step Kit	
1725150	**iTaq Universal SYBR Green One-Step Kit**, 100 reactions, 1 ml (1 x 1 ml vial), includes 25 µl RT (1 vial), nuclease-free water (1 vial)
1725151	**iTaq Universal SYBR Green One-Step Kit**, 500 reactions, 5 ml (5 x 1 ml vials), includes 125 µl RT (1 vial), nuclease-free water (1 vial)

iTaq™ Universal Probes One-Step Kit

The iTaq universal probes one-step kit is a fast and convenient solution for real-time PCR using the powerful combination of RNase H+ MMLV reverse transcriptase and hot-start iTaq DNA polymerase in one fast reaction. It provides improved PCR efficiency, wider dynamic range, superior sensitivity and specificity, and inhibitor tolerance without affecting performance, even with cell lysates.

- **Increase sensitivity, specificity, and efficiency** — advanced formulation enables robust performance with a wide variety of sample types and target sequences
- **Obtain superior results with multiplex reactions** — enhanced chemistry enables up to 3 target amplifications at the same time, resulting in higher data precision with fewer pipetting steps and reduced sample usage
- **Carry out high-throughput real-time PCR screening and validation** — simplified workflow and reduced cycling times enable screening and validation of a great number of samples and targets in a short period of time
- **Use any real-time PCR system** — the universal reference dye in this reaction mix enables ROX normalization of qPCR data regardless of the ROX level requirements of the qPCR system
- **Achieve superior real-time PCR results under most conditions** — robust formulation delivers consistent performance in fast cycling across a broad range of reaction conditions, primer concentrations, and temperature ranges

Applications and Uses of iTaq Universal Probes One-Step Kit

- Real-time PCR
- Gene expression analysis
- Multiplexing
- Absolute quantification
- Pathogen/virus detection

Instrument Compatibility

The iTaq universal probes one-step kit is compatible with Bio-Rad's and all other commercially available real-time qPCR systems.

For More Information
Web: bio-rad.com/supermixes
View the Universal Real-Time PCR Reagents Web App: bio-rad.com/App/UniversalSupermixes

Ordering Information

Catalog #	Description
iTaq Universal Probes One-Step Kit	
1725140	**iTaq Universal Probes One-Step Kit**, 100 reactions, 1 ml (1 x 1 ml vial), includes 50 µl RT (1 x 50 µl vial), nuclease-free water (1 vial)
1725141	**iTaq Universal Probes One-Step Kit**, 500 reactions, 5 ml (5 x 1 ml vials), includes 250 µl RT (2 x 125 µl vials), nuclease-free water (1 vial)

See Also
PCR plastic consumables: page 387.

SsoAdvanced™ PreAmp Supermix

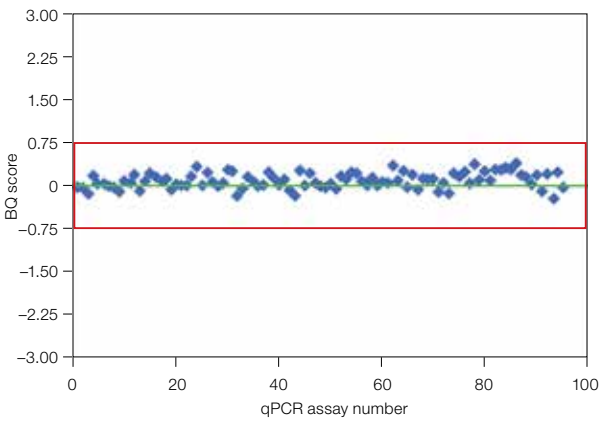
SsoAdvanced PreAmp Supermix is a 2x concentrated, ready-to-use reaction master mix optimized for unbiased, target-specific preamplification of cDNA and genomic DNA (gDNA). This supermix preamplifies DNA templates using up to 400 PrimePCR™ PreAmp Assays (for use downstream with PrimePCR Gene Expression Assays), custom designed SYBR® Green or hydrolysis probe assays, and TaqMan Assays.

Sso7d Fusion Polymerase Technology Enables Unbiased Preamplification

The SsoAdvanced PreAmp Supermix utilizes our highly processive Sso7d fusion polymerase to enable preamplification of up to 400 targets with minimal bias. The increased processivity of the Sso7d fusion polymerase ensures that all targets — even difficult targets — are amplified efficiently. This reduction of preamplification bias is critical for ensuring accuracy of the results from downstream quantitative real-time PCR analysis.

- **Analyze up to 400 targets** — when the number of genes that can be analyzed in an experiment is limited by the amount of sample, preamplification will extend the amount of sample available for analysis
- **Requires as little as 100 pg DNA** — enables analysis of any precious or limited sample, such as stem cells, laser capture microdissections, and formalin-fixed paraffin-embedded tissues
- **Optimized for use with PrimePCR** — use PrimePCR PreAmp Assays before downstream analysis with PrimePCR Gene Expression Assay

For More Information
Web: bio-rad.com/PreAmp
Request or download bulletin: 6576



Minimal bias observed during preamplification of 100 targets. Preamplification was performed on a cDNA sample for ten cycles using SsoAdvanced PreAmp Supermix and 100 PrimePCR PreAmp Assays. The preamplified cDNA was diluted and used in qPCR analysis alongside cDNA that was not subject to preamplification. The bias quantification (BQ) score shows the difference in the results (quantification cycle [Cq] value) for the samples with and without preamplification. BQ scores close to zero indicate a lack of preamplification bias.

Ordering Information

Catalog #	Description
1725160	**SsoAdvanced PreAmp Supermix**, 1.25 ml (1 x 1.25 ml vial), 50 x 50 µl reactions

SingleShot™ Cell Lysis Kits

SingleShot Cell Lysis Kits rapidly generate cell lysates that are optimized for reverse transcription quantitative PCR (RT-qPCR) analysis without RNA purification.

Features include:

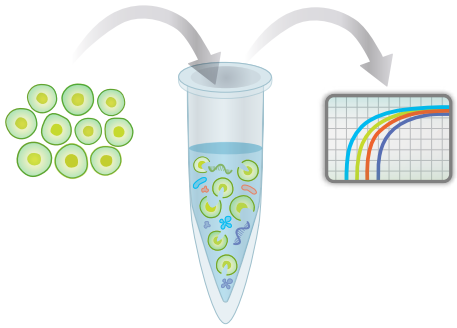
- Compatibility with 10–100,000 adherent or suspension cells
- Lysates prepared in 20 minutes
- Complete removal of genomic DNA
- Preservation of RNA integrity by an RNase inhibitor
- Simple, short protocol suitable for automation and high-throughput experiments
- No loss of rare transcripts from column purification
- Produces accurate and sensitive qPCR data
- Validated with PrimePCR™ assays and panels
- Results comparable to those produced using purified RNA

SingleShot Cell Lysis Kit

The SingleShot Cell Lysis Kit provides the reagents necessary for producing RT-qPCR–ready cell lysates in approximately 20 minutes. Reagents for RT-qPCR are not included.

SingleShot Two-Step Kits

SingleShot Two-Step Kits include reagents to perform RT-qPCR using a two-step workflow with separate cDNA synthesis and qPCR steps. These kits provide RT-qPCR data from cultured cells in just a little over 2 hours. The SingleShot RNA control is included to help optimize cell number input and the amount of lysate used in the RT-qPCR.



SingleShot One-Step Kits

SingleShot One-Step Kits include reagents to perform one-step RT-qPCR utilizing integrated cDNA synthesis and qPCR steps. These kits provide RT-qPCR data from cultured cells in approximately 1.5 hours. The SingleShot RNA control is included to help optimize cell number input and the amount of lysate used in the RT-qPCR.

For More Information
Web: bio-rad.com/singleshot

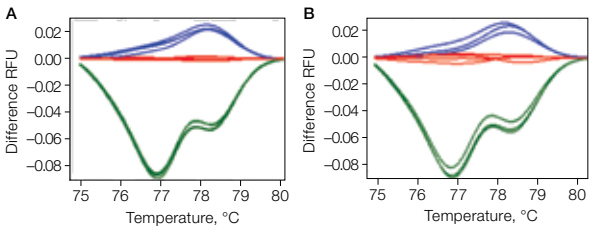
Ordering Information

Catalog #	Description
1725080	**SingleShot Cell Lysis Kit**, 100 x 50 µl reactions
1725081	**SingleShot Cell Lysis Kit**, 500 x 50 µl reactions
One-Step Kits	
1725070	**SingleShot Probes One-Step Kit**, 100 x 50 µl reactions
1725095	**SingleShot SYBR Green One-Step Kit**, 100 x 50 µl reactions
Two-Step Kits	
1725090	**SingleShot Probes Kit**, 100 x 50 µl reactions
1725085	**SingleShot SYBR Green Kit**, 100 x 50 µl reactions

Precision Melt Supermix (HRM)

- Sensitive and specific discrimination of class I–IV SNPs across a broad range of amplicons
- Ideal solution for insertions or deletions >6 base pairs
- De novo SNP discovery
- Accurate quantification of CpG methylation status for epigenetic studies
- Ideal for mutation screening of small mutations or when using a primer walking approach for larger regions
- Exceptional room temperature stability for high-throughput HRM studies
- Optimized formulation containing EvaGreen dye delivers robust PCR and HRM performance

For More Information
Web: bio-rad.com/supermixes
Request or download bulletins: 5798 and 6137



Exceptional stability enables high-throughput genotyping analysis with precision melt supermix. Specific amplification and accurate discrimination of a class IV SNP (84 bp amplicon) from mouse genomic DNA was performed on a CFX384™ real-time PCR detection system either 0 hr (**A**) or 48 hr (**B**) after reaction setup. Wild type (■), heterozygote (■), and homozygous mutant (■) are shown in the difference plots normalized to wild-type samples. Total run time including melt curve = 150 min. RFU, relative fluorescence units.

Ordering Information

Catalog #	Description
1725110	**Precision Melt Supermix**, 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725112	**Precision Melt Supermix**, 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions

Reverse Transcription Reagents

Bio-Rad's reverse transcription reagents are formulated for efficient reverse transcription across a broad linear dynamic range. A potent RNase A inhibitor protects RNA during setup and reverse transcription. Reagents have flexible input RNA capacity to suit different experimental needs and are optimized for gene expression analysis using real-time PCR.

For More Information
Web: bio-rad.com/RTreagents
bio-rad.com/iscript
bio-rad.com/rt_tutorial

Feature	RECOMMENDED Minimum Reaction Setup Time	NEW! Effective Genomic DNA Removal before RT	Maximum Input RNA for High cDNA Yields	Flexible Priming Options	Reliable Value Solution
Product	iScript Reverse Transcription Supermix for RT-qPCR	iScript gDNA Clear cDNA Synthesis Kit	iScript Advanced cDNA Synthesis Kit for RT-qPCR	iScript Select cDNA Synthesis Kit	iScript cDNA Synthesis Kit
Applications	▪ Gene expression ▪ RNA quantification	▪ Gene expression ▪ RNA quantification	▪ Gene expression ▪ RNA quantification	▪ Gene expression ▪ Cloning ▪ RNA quantification	▪ Gene expression ▪ RNA quantification
Total input RNA	1 µg–1 pg	1 µg–1 pg	7.5 µg–100 fg	1 µg–1 pg	1 µg–100 fg
Format	1 tubes	3 tube	2 tubes	5 tubes	2 tubes
Kit contents	▪ 5x iScript RT Supermix ▪ No-RT control supermix	▪ 5x iScript RT Supermix ▪ No-RT control supermix ▪ DNase ▪ DNase buffer	▪ iScript Reverse Transcriptase ▪ 5x iScript Advanced Reaction Mix	▪ iScript Reverse Transcriptase ▪ 5x iScript Reaction Mix ▪ 3 priming options	▪ iScript Reverse Transcriptase ▪ 5x iScript Reaction Mix
Time to produce cDNA	26 min	36 min	21 min	40–90 min	26 min
RNase H+ activity	High	High	High	High	High

iScript™ Reverse Transcription Kits

iScript Advanced cDNA Synthesis Kit for RT-qPCR

- Increased qPCR data throughput and cost effectiveness from a single 20 µl RT reaction
- Superior sensitivity and broad linear dynamic range for RT (7.5 µg–100 fg)
- 2-tube kit (5x iScript reaction mix and iScript reverse transcriptase) for ease of use and reduced reaction setup time
- Optimized blend of oligo(dT) and random primers ensures complete and unbiased RNA sequence representation
- RNase H+ MMLV reverse transcriptase (preblended with RNase inhibitor) delivers high sensitivity for RT-qPCR and eliminates additional RNase H+ step
- Potent blend of RNase A inhibitor protects RNA during setup and RT
- Short 21 min protocol allows fast qPCR data generation

iScript Reverse Transcription Supermix for RT-qPCR

- 1-tube format for simple and fast setup and reduced pipetting variability
- 5x formulation enables RNA volumes up to 16 µl, avoiding the need to concentrate your sample
- Liquid format at –20°C offers superior stability and eliminates freeze/thaw cycle
- Superior sensitivity and broad linear dynamic range for RT (1 µg–1 pg)
- Optimized blend of oligo(dT) and random primers ensures complete and unbiased RNA sequence representation
- RNase H+ MMLV reverse transcriptase (preblended with RNase inhibitor) delivers high sensitivity for RT-qPCR and eliminates additional RNase H+ step
- Potent blend of RNase A inhibitor protects RNA during setup and RT
- Short 26 min protocol allows fast qPCR data generation

iScript cDNA Synthesis Kit

- 2-tube kit (5x iScript reaction mix and iScript reverse transcriptase) for ease of use and reduced reaction setup time
- Superior sensitivity and broad linear dynamic range for RT (1 µg–100 fg)

- Optimized blend of oligo(dT) and random primers ensures complete and unbiased RNA sequence representation
- RNase H+ MMLV reverse transcriptase (preblended with RNase inhibitor) delivers high sensitivity for RT-qPCR and eliminates additional RNase H+ step
- Potent blend of RNase A inhibitor protects RNA during setup and RT
- Short 26 min protocol allows fast qPCR data generation

iScript Select cDNA Synthesis Kit

- 5-tube kit (random primers, oligo(dT), 5x iScript Select reaction mix, iScript reverse transcriptase, and gene-specific primer-enhancer solution)
- Choice of priming strategy
- Reliable synthesis of long cDNA >6 kb in length
- Superior sensitivity and broad linear dynamic range for RT (1 µg–1 pg)

NEW iScript gDNA Clear cDNA Synthesis Kit

iScript gDNA Clear cDNA Synthesis Kit generates qPCR-ready cDNA free of gDNA for accurate gene expression analysis in as little as 36 minutes. The kit consists of the iScript Reverse Transcription Supermix and a specially formulated DNase. Features and benefits include:

- Effective gDNA clearance in 10 min with a specially formulated DNase
- Convenient all-in-one RT supermix for simple and fast setup and reduced pipetting variability
- Simple workflow and short 36 min protocol for fast generation of gDNA-free cDNA
- Ready-to-use no RT control included in the kit to monitor gDNA contamination

For More Information
Request or download bulletin: 6090

Ordering Information

Catalog #	Description
iScript Advanced cDNA Synthesis Kit for RT-qPCR	
1725037	**iScript Advanced cDNA Synthesis Kit for RT-qPCR**, 25 x 20 µl reactions, includes 100 µl 5x iScript advanced reaction mix, 25 µl iScript advanced reverse transcriptase, and nuclease-free water
1725038	**iScript Advanced cDNA Synthesis Kit for RT-qPCR**, 100 x 20 µl reactions, includes 400 µl 5x iScript advanced reaction mix, 100 µl iScript advanced reverse transcriptase, and nuclease-free water
iScript Reverse Transcription Supermix for RT-qPCR	
1708840	**iScript Reverse Transcription Supermix for RT-qPCR**, 25 x 20 µl reactions, includes 100 µl 5x iScript RT supermix, 200 µl 5x iScript RT supermix no-RT control (50 reactions), and nuclease-free water
1708841	**iScript Reverse Transcription Supermix for RT-qPCR**, 100 x 20 µl reactions, includes 400 µl 5x iScript RT supermix, 200 µl 5x iScript RT supermix no-RT control (50 reactions), and nuclease-free water
iScript cDNA Synthesis Kit	
1708890	**iScript cDNA Synthesis Kit**, 25 x 20 µl reactions, includes 100 µl 5x iScript reaction mix, 25 µl iScript reverse transcriptase, and nuclease-free water
1708891	**iScript DNA Synthesis Kit**, 100 x 20 µl reactions, includes 400 µl 5x iScript reaction mix, 100 µl iScript reverse transcriptase, and nuclease-free water
iScript Select cDNA Synthesis Kit	
1708896	**iScript Select cDNA Synthesis Kit**, 25 x 20 µl reactions, includes 400 µl iScript select reaction mix, 25 µl iScript reverse transcriptase, 200 µl oligo(dT) mix, 200 µl random primer mix, 200 µl gene-specific primer enhancer solution, and nuclease-free water
1708897	**iScript Select cDNA Synthesis Kit**, 100 x 20 µl reactions, includes 400 µl iScript Select reaction mix, 100 µl iScript reverse transcriptase, 200 µl oligo(dT) mix, 200 µl random primer mix, 200 µl gene-specific primer enhancer, and nuclease-free water
iScript gDNA Clear cDNA Synthesis Kit	
1725034	**iScript gDNA Clear cDNA Synthesis Kit**, 25 x 20 µl reactions, includes 100 µl 5x iScript RT supermix, 200 µl 5x iScript no-RT control supermix, 12.5 µl iScript DNase, 150 µl iScript DNase buffer, 1.5 ml nuclease free water
1725035	**iScript gDNA Clear cDNA Synthesis Kit**, 100 x 20 µl reactions, includes 400 µl 5x iScript RT supermix, 400 µl 5x iScript no-RT control supermix, 50 µl iScript DNase, 150 µl iScript DNase buffer, 1.5 ml nuclease free water

Standard PCR Reagents

iProof™ High-Fidelity DNA Polymerase

- A high-fidelity DNA polymerase with 52-fold more accuracy than Taq DNA polymerase
- Unique *Pyrococcus*-like proofreading enzyme is fused to a dsDNA binding protein, Sso7d
- Long and fast PCR applications — fragments up to 37 kb are amplified in less time (15–30 sec/kb) and with less enzyme (0.25–1 U/reaction)
- Convenient 2x supermix formats available with GC or HF high-fidelity buffers

For More Information
Request or download bulletin: 5211
Web: bio-rad.com/standardpcrreagents

dNTP Mix

- Formulated for consistency and higher efficiency in PCR and qPCR
- Robust dNTP solution withstands multiple rounds of freeze-thawing and temperature cycling

iTaq DNA Polymerase

- Antibody-mediated hot-start DNA polymerase for quick 3 min activation at 95°C
- The hot-start polymerase prevents nonspecific amplification and primer-dimers in both PCR and real-time PCR applications

For More Information
Request or download bulletin: 2779

Ordering Information

Catalog #	Description
iProof High-Fidelity DNA Polymerase, Master Mixes, and Buffers	
1725300	**iProof High-Fidelity DNA Polymerase**, 2 U/µl, 20 U, includes 5x reaction buffers, $MgCl_2$ solution, DMSO
1725301	**iProof High-Fidelity DNA Polymerase**, 2 U/µl, 100 U
1725302	**iProof High-Fidelity DNA Polymerase**, 2 U/µl, 500 U
1725330	**iProof High-Fidelity PCR Kit**, 2 U/µl, 50 U, includes 5x reaction buffers, $MgCl_2$ solution, DMSO, dNTPs, λ DNA, 1.3 and 10 kb primers, DNA standard
1725331	**iProof High-Fidelity PCR Kit**, 2 U/µl, 200 U, includes 5x reaction buffers, $MgCl_2$ solution, DMSO, dNTPs, λ DNA, 1.3 and 10 kb primers, DNA standard
1725310	**iProof HF Master Mix**, 2.5 ml, 100 x 50 µl reactions (for highest fidelity with most templates)
1725320	**iProof GC Master Mix**, 2.5 ml, 100 x 50 µl reactions (for GC-rich templates)
1725391	**5x iProof HF Buffer**, 1.5 ml (for highest fidelity with most templates)
1725392	**5x iProof GC Buffer**, 1.5 ml (for GC-rich templates)
1725393	**5x iProof HPLC HF Buffer**, 1.5 ml
1725394	**5x iProof HPLC GC Buffer**, 1.5 ml
dNTP Mix	
1708874	**dNTP Mix**, 200 µl premixed solution, contains 10 mM each dNTP (dATP, dCTP, dGTP, dTTP)
iTaq DNA Polymerase	
1708870	**iTaq DNA Polymerase**, 5 U/µl, includes 250 U polymerase, 1.25 ml 10x PCR buffer
1708875	**iTaq DNA Polymerase**, 5 U/µl, includes 5,000 U polymerase, 25 ml 10x PCR buffer, 25 ml 50 mM $MgCl_2$ solution
$MgCl_2$	
1708872	**$MgCl_2$ Solution**, 50 mM, 1.25 ml

PCR and Real-Time PCR Accessories

ROX Passive Reference Dye

- Formulated as a 50x concentrated stock solution for use on ABI 7000, 7300, 7700, and 7900 qPCR instruments
- For instruments that use 580–585 nm excitation for passive reference, such as Stratagene Mx3000P, Mx3005P, and Mx4000, and ABI 7500 real-time PCR instruments, treat as a 750x concentrated solution
- An internal reference is not required for any Bio-Rad real-time detection system

Precision Blue™ Real-Time PCR Dye

- Concentrated, ready-to-use dye to increase visibility of real-time PCR reaction mixtures
- Optimized for use with all Bio-Rad universal real-time supermixes and one-step kits

For More Information
Request or download bulletin: 6090

Ordering Information

Catalog #	Description
ROX Passive Reference Dye	
1725858	**ROX Passive Reference Dye**, 0.5 ml
Precision Blue Real-Time PCR Dye	
1725555	**Precision Blue Real-Time PCR Dye**, 55 µl, 200x concentrated blue visualization dye for use with real-time PCR systems

PCR Plate Sealer

See Also

Heat sealing films and foils: page 399.

SsoAdvanced™ universal SYBR® Green supermix: page 373.

iTaq™ universal SYBR® Green supermix: page 375.

PX1™ PCR Plate Sealer

The PX1 PCR plate sealer consistently seals PCR plates by providing uniform heat and pressure across an entire microplate when sealing. This semiautomated heat sealer helps deliver reliable results by removing human variability from plate sealing and minimizing sample evaporation.

The PX1 sealer features an easy-to-use, intuitive touch-screen interface. The thermal sealing process is simplified by allowing sealing temperature and time to be modified with the touch of a button.

- **Fast startup time** — avoid delaying an experiment while the sealer warms up
- **Extremely intuitive** — save time programming the instrument
- **Quickly access sealing protocols** — save programming time by using stored protocols

- **Compact footprint** — accommodate crowded laboratory benches
- **Fully validated** — have confidence in your results

For More Information
Web: bio-rad.com/pcrplatesealer
Request or download bulletin: 6257

Ordering Information

Catalog #	Description
PX1 PCR Plate Sealer	
1814000	**PX1 PCR Plate Sealer**, includes heat sealing instrument, 96-well/384-well plate support block, sealing frame, power cord
Accessories	
1814080	**Sealing Frame**, extra sealing frame for use with PX1 PCR plate sealer, 1
1814085	**Plate Support Block**, extra plate support block for use with PX1 PCR plate sealer, 1
Heat Seals for PX1 PCR Plate Sealer	
1814030	**Optically Clear Heat Seal**, package of 100
1814035	**Permanent Clear Heat Seal**, package of 100
1814040	**Pierceable Foil Heat Seal**, package of 100
1814045	**Peelable Foil Heat Seal**, package of 100

For more information about the heat seals that are compatible with the PX1 PCR plate sealer, see page 397.

PCR Plastic Consumables

Bio-Rad thin-wall PCR tubes, PCR plates, seals, and accessories are manufactured for optimal fit and cycling performance in a variety of thermal cyclers and real-time PCR instruments, including all Bio-Rad platforms. These high-quality consumables are suitable for a wide variety of applications. Bio-Rad tubes, tube caps, and PCR plates are molded, inspected, and packaged in a Class 100,000 or 10,000 cleanroom environment to prevent possible nucleic acid or nuclease contamination, then process-sampled and tested to be negative for DNase, RNase, and human DNA.

For More Information
Web: bio-rad.com/pcrplastics
Request or download bulletin: 6090

Instrument Compatibility of PCR Plastic Consumables

	Individual and Strip Tubes			384-Well Plates		96-Well Plates	
	Individual High-Profile	**Strips High-Profile**	**Strips Low-Profile**	**Hard-Shell® Standard**	**Hard-Shell 480**	**Microseal® Semi-Skirted High-Profile**	**Microseal Skirted Low-Profile**
Product	TBI-0201, TFI-0201, TWI-0201 page 389	TBC-xxxx*, TBS-xxxx* page 389	TLS-08xx* page 389	HSP-3xxx* page 395	HSR-48xx* page 396	MSS-xxxx* page 394	MSP-9xxx* page 394
Thermal Cycler							
Bio-Rad® C1000™, C1000 Touch™, S1000™	•	•	•	•	•		•
Bio-Rad® DNA Engine®, Tetrad®, Tetrad 2, Dyad®, Dyad Disciple™, PTC-100®	•	•	•	•	•		•
Bio-Rad® T100™, MyCycler™, iCycler®	•	•					
Bio-Rad® MJ Mini™	•	•	•				
Applied Biosystems 0.2 ml tube cyclers (2720, 9700, Veriti)	•	•				•	
Applied Biosystems 0.1 ml tube cyclers (9800 fast, Veriti fast)			•				
Applied Biosystems 384-well cyclers (9700, Veriti)				•	•		
Eppendorf Mastercycler series	•	•	•	•	•		•
Real-Time PCR Instrument							
Bio-Rad® CFX Connect™, CFX96™, CFX96 Touch™, CFX384™**, CFX384 Touch™**			•	•	•		•
Bio-Rad® iCycler iQ®, iQ™5, MyiQ™, MyiQ™2		•					
Bio-Rad® Chromo4™		•	•				•
Bio-Rad® DNA Engine Opticon®, Opticon™ 2			•				•
Bio-Rad® MiniOpticon™**			•				
Applied Biosystems standard systems (7300, 7500, 7900HT, ViiA 7)		•		•	•	•	
Applied Biosystems fast systems (7500 fast, 7900HT fast, StepOne, StepOnePlus, ViiA 7)			•	•	•		
Eppendorf Mastercycler ep *realplex*		•	•				•
Stratagene (Agilent) Mx series		•					
Corbett (QIAGEN) Rotor-Gene	•						
Roche LightCycler 480					•		
Other Instruments							
Applied Biosystems DNA sequencers (3100, 3700, 3730)				•		•	
Idaho Technology LightScanner				•			•

continues

Instrument Compatibility of PCR Plastic Consumables (cont.)

	96- and 48-Well Plates						
	Hard-Shell Semi-Skirted High-Profile	**Hard-Shell Skirted Low-Profile**	**Hard-Shell Semi-Skirted Low-Profile**	**Hard-Shell 480**	**Multiplate™ Unskirted High-Profile**	**Multiplate Unskirted Low-Profile**	**iQ™ Semi-Skirted High-Profile**
Product	HSS-9xxx* page 392	HSP-9xxx* page 392	HSL-9xxx page 392	HSR-9xxx page 392	MLP-xxxx* page 393	MLL-xxxx* page 393	223-9441 page 394
Thermal Cycler							
Bio-Rad C1000, C1000 Touch, S1000	•	•	•		•	•	•
Bio-Rad DNA Engine, DNA Engine Tetrad®, DNA Engine Tetrad 2, DNA Engine Dyad®, Dyad Disciple, PTC-100	•	•			•	•	•
Bio-Rad MyCycler					•		•
Bio-Rad T100, iCycler	•				•		•
Bio-Rad MJ Mini					•	•	
Applied Biosystems 0.2 ml tube cyclers (2720, 9700, Veriti)	•				•		•
Applied Biosystems 0.1 ml tube cyclers (9800 fast, Veriti fast)			•			•	
Eppendorf Mastercycler series	•	•	•		•	•	•
Real-Time PCR Instrument							
Bio-Rad CFX Connect, CFX96, CFX96 Touch		•	•			•	
Bio-Rad iCycler iQ, iQ 5, MyiQ, MyiQ2	•				•		•
Bio-Rad Chromo4	•	•			•	•	•
Bio-Rad DNA Engine, DNA Engine Opticon, Opticon 2		•				•	
Bio-Rad MiniOpticon**						•	
Applied Biosystems standard systems (7500, 7900HT, ViiA 7)	•				• Except 7900HT		• Except 7900HT
Applied Biosystems (StepOnePlus)						•	
Applied Biosystems (7500 fast, ViiA 7 fast)			•			•	
Applied Biosystems (QuantStudio 96 Standard)	•						
Eppendorf Mastercycler ep *realplex*	•	•	•		•	•	•
Stratagene (Agilent) Mx series	•				•		•
Roche LightCycler 480/96				•			
Other Instruments							
Applied Biosystems DNA sequencers (3100, 3700, 3730)	•				•		
Idaho Technology LightScanner		•			•	•	

* Go to the page numbers shown for the list of catalog numbers containing this prefix.

** CFX384, CFX384 Touch, and MiniOpticon real-time PCR detection systems are factory calibrated for white tubes and white-well plates. White plastics are recommended due to their superior signal-to-noise ratio. Using clear tubes or clear-well plates on these instruments will require user calibration.

Thin-Wall PCR Tubes

PCR Tubes and Strips

Individual PCR Tubes, 0.2 and 0.5 ml

These high-profile PCR tubes have double-locking caps that won't pop open during cycling. PCR volume ranges are 5–125 µl for 0.2 ml tubes and 10–200 µl for 0.5 ml tubes. Tubes with flat, frosted caps for easy labeling are available in both 0.2 and 0.5 ml sizes (not suitable for real-time PCR). The 0.5 ml individual tubes with attached caps are available in resealable plastic bags of 100 tubes.

PCR Tube and Cap Strips

Both tubes and caps are available in strips of 8 or 12 for use in 48- and 96-well sample blocks.

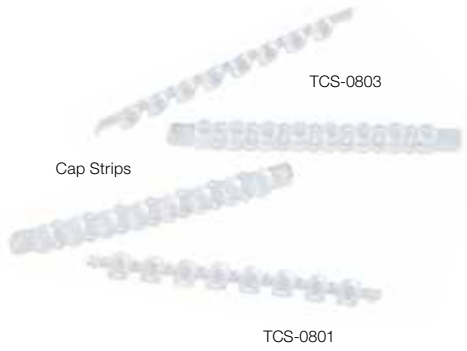
- Tight sealing and convenient handling for multiple samples
- Choice of domed or flat optical cap strips

High-Profile PCR Tube Strips

Recommended reaction volumes are 5–125 µl. Tube strips and domed cap strips are also available packaged together in convenient bags sufficient for 96 samples. The resealable bags protect unused tubes and caps from accidental contamination.

Low-Profile PCR Tube Strips

These tubes reduce the potential for condensation and also allow greater light capture in fluorescence assays such as those performed in real-time PCR. Low-profile tubes are ideal for use in fast and low-volume PCR reactions. Overall height, including flat optical caps and 96-place rack, is 18.3 mm. Tube height is 15.5 mm. Low-profile tubes are available in opaque white for optical applications.



Flat and Domed Cap Strips for PCR Tubes and PCR Plates

These cap strips provide extremely tight sealing of all Bio-Rad PCR tubes and plates during thermal cycling and cold storage. Flat cap strips feature ultraclear upper surfaces, which are ideal for fluorescence applications. Average light transmittance is 1.7-fold higher than with standard-clarity domed cap strips. Flat caps are available in strips of 8 and domed caps are available in strips of 8 or 12. Use of a capping tool is recommended for proper sealing of caps on tubes or plates.

For More Information
Web: bio-rad.com/pcrplastics

Ordering Information

Catalog #	Description
Individual PCR Tubes with Attached Caps (0.2 ml)	
TFI0201	**PCR Tubes with Flat Caps (0.2 ml)**, clear, 1,000
TWI0201	**PCR Tubes with Domed Caps (0.2 ml)**, clear, 1,000
Individual PCR Tubes without Caps (0.2 ml)	
TBI0201	**PCR Tubes without Caps (0.2 ml)**, clear, 1,000
Individual PCR Tubes with Attached Caps (0.5 ml)	
TBI0501	**PCR Tubes with Flat Caps (0.5 ml)**, clear, 1,000 (2 bags of 500)
TBI0502	**PCR Tubes with Flat Caps (0.5 ml)**, clear, 800 (8 bags of 100)
High-Profile Tube Strips without Caps (0.2 ml)	
TBS0201	**8-Tube Strips without Caps**, clear, 125 strips (1,000 PCR tubes)
TBS1201	**12-Tube Strips without Caps**, clear, 100 strips (1,200 PCR tubes)
Low-Profile 8-Tube Strips without Caps (0.2 ml)	
TLS0801	**Low-Profile 8-Tube Strips without Caps**, clear, 120 strips (960 PCR tubes)
TLS0851	**Low-Profile 8-Tube Strips without Caps**, white, 120 strips (960 PCR tubes)
Domed Cap Strips	
TCS0801	**Domed 8-Cap Strips**, for PCR tubes and plates, clear, 130
TCS1201	**Domed 12-Cap Strips**, for PCR tubes and plates, clear, 200
Optical Flat Cap Strips	
TCS0803	**Optical Flat 8-Cap Strips**, for PCR tubes and plates, ultraclear, 120
High-Profile Polypropylene Tube Strips with Domed Cap Strips (0.2 ml)	
TBC0802	**8-Tube Strips and Domed Cap Strips**, clear, 20 bags of 12 x 8-tube strips and 12 x 8-cap strips (1,920 PCR tubes and caps)
TBC1202	**12-Tube Strips and Domed Cap Strips**, clear, 20 bags of 8 x 12-tube strips and 8 x 12-cap strips (1,920 PCR tubes and caps)

Capping Tools and Racks

96-Place PCR Tube Rack and Cover

These stackable storage units for tubes and unskirted and semi-skirted PCR plates provide a stable platform for preparing or centrifuging reactions.

PCR Tube Rack

The PCR tube rack conforms to ANSI/SBS standards and provides a stable platform for PCR tubes and 96-well plates.

Easy Cap™ Tool

The Easy Cap tool provides the pressure necessary to achieve a tight seal, one tube at a time, when capping individual or strip tubes. The narrow end securely fastens domed caps to tubes or 96-well PCR plates. The wide end firmly holds thin-wall 0.5 ml tubes to prevent accidental crushing when opening or closing. The side slot allows easy opening of tight-fitting caps without generating aerosols.

Strip Cap Tool

This tool quickly and easily seals 8- and 12-cap strips on PCR plates or tubes. A grooved channel on one side is designed to seal domed caps, while the flat edge on the opposite side seals flat caps. For best results, seal tube strips while they are in a thermal cycler block or in a 96-place rack.

For More Information
Web: bio-rad.com/PCRplasticaccessories

Ordering Information

Catalog #	Description
TRC9601	**PCR Tube Racks**, ANSI/SBS standard, white, 10
TRC0501	**96-Place Racks**, with covers, for PCR tubes and unskirted and semi-skirted microplates, assorted colors, 5
ECT1000	**Easy Cap Tool**, ensures tight seal for 0.2 ml PCR tubes or 96-well microplates
ECT2000	**Strip Cap Tool**, for sealing 8- and 12-cap strips on PCR plates or tubes

PCR Plates

Multiplate™ 48-Well PCR Plates

The versatile, unskirted design and 48-well format make these Multiplate unskirted PCR plates ideal for laboratories using 48-well blocks on Bio-Rad instruments. The plates are suitable for reaction volumes of 5–125 µl. The polypropylene construction of Multiplate PCR plates confers very low protein binding and excellent preservation of sample volume. When less than a full plate is needed, these plates can be easily cut with scissors to the required size. Two plate styles are available:

- **High-profile (20.7 mm) wells, clear color** — designed to fit in most thermal cyclers
- **Low-profile (15.5 mm) wells, clear color or white** — optimized for fast PCR and low-volume reactions

For More Information
Web: bio-rad.com/48wellpcrplates

Multiplate High-Profile 48-Well Unskirted PCR Plate

Multiplate Low-Profile 48-Well Unskirted PCR Plate

Ordering Information

Catalog #	Description
MLP4801	**Multiplate High-Profile 48-Well Unskirted PCR Plates**, clear, 50 plates
MLL4801	**Multiplate Low-Profile 48-Well Unskirted PCR Plates**, clear, 50 plates
MLL4851	**Multiplate Low-Profile 48-Well Unskirted PCR Plates**, white, 50 plates

See Also

PX1 PCR plate sealer: page 386.

Heat sealing films and foils: page 399.

PCR plate seals: page 397.

Hard-Shell® 96-Well PCR Plates

Hard-Shell PCR plates are specifically designed to withstand the stresses of heat sealing, thermal cycling, and robotic handling. The patented* two-component design features a skirt and deck molded from a rigid, thermostable polymer. The thin-wall wells are molded of virgin polypropylene selected for low DNA binding. These plates can withstand –80°C storage and high centrifugation forces, making them convenient for alcohol precipitations. Uniform wells reduce well-to-well variability in optical assays.

- White-well option allows increased fluorescent signal strength
- Black alphanumeric labeling for easy well identification
- Color-coded skirts with clear or white wells
- Low-cost, user-readable barcode option

Hard-Shell Low-Profile 96-Well Skirted PCR Plates

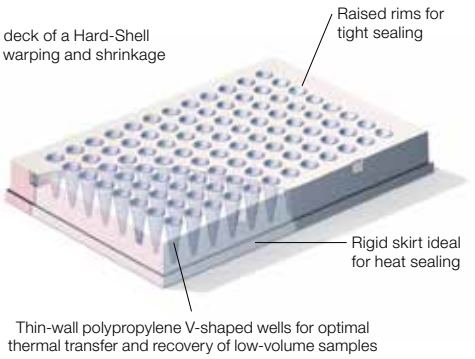
- Reaction volumes of 5–125 µl (200 µl maximum)
- Low-profile (16.06 mm) wells optimized for low-volume reactions and fast PCR
- Full skirt for robotic handling and labeling surface
- Footprint and well spacing that match ANSI/SBS standard dimensions
- Barcoded plates are available

Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates

- Reaction volumes of 5–125 µl (350 µl maximum)
- High-profile (20.75 mm) wells that fit most thermal cyclers, real-time PCR detection systems, and DNA sequencers
- Warp-free half-height skirt for improved robotic handling
- Barcoded plates are available

Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates

- Reaction volumes of 5–125 µl (200 µl maximum)
- Low-profile (15.51 mm) wells optimized for low-volume reactions and fast PCR
- Semi-skirted design enables compatibility with Applied Biosystems 7500 fast and ViiA 7 fast instruments
- Footprint and well spacing that match ANSI/SBS standard dimensions
- Barcoded plates are available



Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plate

Hard-Shell 96-Well 480 PCR Plates

Hard-Shell 96-well 480 PCR plates are optimized to work on the Roche LightCycler 480 and 96 systems with a 96-well block. They are designed to withstand the stresses of thermal cycling. Superior stability and flatness is provided via a two-component design. Features include:

- Designed specifically for the Roche LightCycler 480 and 96
- Extremely uniform wells that reduce well-to-well variability in real-time PCR
- Warp-free skirt and deck
- Black alphanumeric labeling for easy well identification
- Footprint and well spacing that match ANSI/SBS standard dimensions
- Barcoded along row A
- 200 µl maximum volume

For More Information
Web: bio-rad.com/96wellpcrplates
Request or download bulletin: 5496

* U.S. patents 6,340,589, 6,528,302, and 7,347,977.

Ordering Information

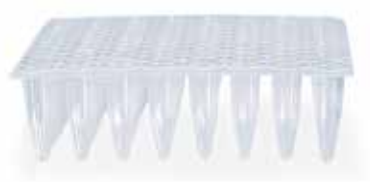
Description	Clear Wells	White Wells	Black Wells
Hard-Shell Low-Profile 96-Well Skirted PCR Plates			
White shell, 50 plates	HSP9601	HSP9655	—
Red shell, 50 plates	HSP9611	—	—
Yellow shell, 50 plates	HSP9621	—	—
Blue shell, 50 plates	HSP9631	HSP9635	—
Green shell, 50 plates	HSP9641	HSP9645	—
Black shell, 50 plates	HSP9661	HSP9665	HSP9666
White shell, barcoded, 50 plates	HSP9901	HSP9955	—
White shell, bulk pack of 400 plates	HSP9601B	—	—
Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates, 25 plates			
Clear shell	HSS9601	—	—
Green shell	HSS9641	—	—
Black shell	—	HSS9665	—
Clear shell, barcoded	HSS9901	—	—
Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, 25 plates			
Clear shell	HSL9601	HSL9605	—
Green shell	HSL9641	HSL9645	—
Clear shell, barcoded	HSL9901	HSL9905	—

Catalog #	Description
Hard-Shell 96-Well 480 PCR Plates	
HSR9905	**Hard-Shell 96-Well 480 PCR Plates**, clear shell/white well PCR plate for use with Roche LightCycler 480 real-time PCR system, barcoded, rigid 2-component designs, 25 plates
HSR9905K	**Hard-Shell 96-Well 480 PCR Plates Kit**, for use with Roche LightCycler 480 real-time PCR system, includes 100 barcoded clear shell/white well PCR plates (4 packs of #HSR-9905) and 100 Microseal 'C' optical seals (#MSC-1001)
HSR9901	**Hard-Shell 96-Well 480 PCR Plates**, clear shell/clear well PCR plate for use with Roche LightCycler 480 real-time PCR system, barcoded, rigid 2-component design, 25 plates
HSR9901K	**Hard-Shell 96-Well 480 PCR Plates Kit**, for use with Roche LightCycler 480 real-time PCR system, includes 100 barcoded clear shell/clear well PCR plates (4 packs of #HSR-9901) and 100 Microseal 'C' optical seals (#MSC-1001)

Multiplate™ 96-Well PCR Plates

Multiplate High-Profile 96-Well Unskirted PCR Plates

The single-component polypropylene construction of Multiplate PCR plates confers very low protein binding and excellent retention of sample. When less than a full plate is needed, these plates are easily cut with scissors to the required size. The plates are suitable for PCR volumes of 5–125 µl.



Multiplate High-Profile 96-Well Unskirted PCR Plate

Multiplate Low-Profile 96-Well Unskirted PCR Plates

Multiplate low-profile PCR plates combine the unskirted feature of the original Multiplate plate, but are 5 mm lower in overall height. The lower height (15.50 mm) reduces the potential for condensation and offers advantages for fast PCR, low-volume reactions, and light capture in fluorescence assays such as real-time PCR. A rigid top surface provides firm handling while still allowing the plate to be cut for use in other formats.

Multiplate Low-Profile 96-Well Unskirted PCR Plate

For More Information
Web: bio-rad.com/96wellpcrplates

Ordering Information

Catalog #	Description
Multiplate High-Profile 96-Well Unskirted PCR Plates	
MLP9601	**Multiplate High-Profile 96-Well Unskirted PCR Plates**, clear, 25 plates
MLP9651	**Multiplate High-Profile 96-Well Unskirted PCR Plates**, white, 25 plates
MLP9631	**Multiplate High-Profile 96-Well Unskirted PCR Plates**, blue, 25 plates
Multiplate Low-Profile 96-Well Unskirted PCR Plates	
MLL9601	**Multiplate Low-Profile 96-Well Unskirted PCR Plates**, clear, 25 plates
MLL9651	**Multiplate Low-Profile 96-Well Unskirted PCR Plates**, white, 25 plates

iQ™ High-Profile 96-Well Semi-Skirted Real-Time PCR Plates

These semi-skirted, high-profile PCR plates are optimized for iQ™5, iCycler iQ®, MyiQ™2, and MyiQ™ real-time PCR detection systems. The semi-skirted design adds stiffness and a labeling surface. Plates are perforated every three columns for easy setup of triplicate reactions.

For More Information
Web: bio-rad.com/96wellpcrplates

Ordering Information

Catalog #	Description
2239441	**iQ High-Profile 96-Well Semi-Skirted PCR Plates**, 25 plates

Microseal® 96-Well PCR Plates

Microseal High-Profile 96-Well Semi-Skirted PCR Plates

These PCR plates are designed for Applied Biosystems 0.2 ml tube cyclers, standard real-time PCR systems, and DNA sequencers. They are not recommended for use in Bio-Rad thermal cyclers because the raised ridges around the plate prevent proper sealing in these instruments.

Microseal High-Profile 96-Well Semi-Skirted PCR Plate

Microseal Low-Profile 96-Well Skirted PCR Plates

These PCR plates feature single-component construction and a skirted design that is suitable for high-throughput plate handling. The robot-friendly design features low-binding polypropylene construction, locator holes, and flat vertical sidewalls for secure handling and easy barcoding. Raised rims around wells provide an excellent surface for tight sealing with a variety of sealing methods and allow easy release of the sealer from the plate. Barcoded plates are also available.

For More Information
Web: bio-rad.com/96wellpcrplates

Microseal Low-Profile 96-Well Skirted PCR Plate

Ordering Information

Catalog #	Description
Microseal High-Profile 96-Well Semi-Skirted PCR Plates	
MSS9601	**Microseal High-Profile 96-Well Semi-Skirted PCR Plates**, clear, 25 plates
Microseal Low-Profile 96-Well Skirted PCR Plates	
MSP9601	**Microseal Low-Profile 96-Well Skirted PCR Plates**, clear, 50 plates
MSP9605	**Microseal Low-Profile 96-Well Skirted PCR Plates**, barcoded, clear, 50 plates

Hard-Shell® 384-Well Standard PCR Plates

Hard-Shell PCR plates are designed to withstand the stresses of thermal cycling and robotic handling. The patented two-component design provides superior stability and flatness, allowing precise positioning for automation. Features include:

- Reaction volumes of 1–30 µl (50 µl maximum)
- Minimized well-to-well variability that results in extremely uniform results in real-time PCR
- Compatibility with most 384-well thermal cyclers, real-time PCR detection systems, and DNA sequencers
- White-well option for increased fluorescent signal strength
- Color-coded skirts with clear or white wells
- Warp-free skirt and deck for improved robotic handling

- Footprint and well spacing that match ANSI/SBS standard dimensions
- Low-cost, user-readable barcode option

For More Information
Web: bio-rad.com/384wellpcrplates
Request or download bulletin: 5496

Ordering Information

Description	Clear Wells	White Wells	Black Wells
Hard-Shell 384-Well Standard PCR Plates			
Clear shell, 50 plates	HSP3801	HSP3805	—
Red shell, 50 plates	HSP3811	—	—
Yellow shell, 50 plates	HSP3821	—	—
Blue shell, 50 plates	HSP3831	—	—
Green shell, 50 plates	HSP3841	—	—
Black shell, 50 plates	—	HSP3865	HSP3866
Clear shell, barcoded, 50 plates	HSP3901	HSP3905	—
Clear shell, bulk pack of 500 plates	HSP3801B	—	—

Hard-Shell® 384-Well 480 PCR Plates

Hard-Shell 384-well 480 PCR plates are optimized to work on the Roche LightCycler 480 and a range of Bio-Rad and Applied Biosystems instruments. They are designed to withstand the stresses of thermal cycling and robotic handling. The two-component design provides superior stability and flatness. Features include:

- Reaction volumes of 1–30 µl (50 µl maximum)
- Minimized well-to-well variability that results in extremely uniform results in real-time PCR
- Warp-free skirt and deck for improved robotic handling
- Black alphanumeric labeling for easy well identification
- Footprint and well spacing that match ANSI/SBS standard dimensions
- Barcoded at row A and column 24 side; available in clear or white well

For More Information
Web: bio-rad.com/384wellpcrplates
Request or download bulletin: 5496

Ordering Information

Catalog #	Description
HSR4805	**Hard-Shell 384-Well 480 PCR Plates**, clear shell/white well PCR plate for Roche LightCycler 480 real-time PCR system, barcoded, rigid 2-component design, 50 plates
HSR4805K	**Hard-Shell 384-Well 480 PCR Plates Kit**, for use with Roche LightCycler 480 real-time PCR system, includes 100 barcoded clear shell/white well PCR plates (2 packs of #HSR-4805) and 100 Microseal 'C' optical seals (#MSC-1001)
HSR4801	**Hard-Shell 384-Well 480 PCR Plates**, clear shell/clear well PCR plate for Roche LightCycler 480 real-time PCR system, barcoded, rigid 2-component design, 50 plates
HSR4801K	**Hard-Shell 384-Well 480 PCR Plates Kit**, for use with Roche LightCycler 480 real-time PCR system, includes 100 barcoded clear shell/clear well PCR plates (2 packs of #HSR-4801) and 100 Microseal 'C' optical seals (#MSC-1001)

Microseal® 384-Well Skirted PCR Plates

Microseal 384-well skirted PCR plates feature single-component construction and are ideal for high-throughput thermal cycling applications.

- Barcoded plates are available
- Footprint and well spacing that match ANSI/SBS standard dimensions

For More Information
Web: bio-rad.com/384wellplates

Ordering Information

Description	50 Plates	Barcoded, 50 Plates
Microseal 384-Well Skirted PCR Plates		
Clear	MSP3842	MSP3846
White	MSP3852	—
Black	MSP3862	—

PCR Seals

Effective sealing is essential for PCR and qPCR reactions. Besides cap strips (page 389), Bio-Rad offers many sealing options to fit your needs.

PCR Plate Seals

Microseal® 'C' Optical Seals

- Optically clear adhesive films designed for tight seals even with wells with raised rims
- Pressure-sensitive adhesive allows easy application during plate sealing
- Designed with superior optical properties for real-time PCR

Microseal 'C' Optical Seals

Microseal 'B' Adhesive Seals, Optically Clear

- Strongest adhesive-based optically clear sealing option designed for real-time PCR plates
- Withstands multiple storage or transport temperatures (–40 to 110°C)

Microseal 'B' Adhesive Seals

Microseal 'A' Film

- A nonoptical, nonadhesive sealing option for quick pressure-based sealing of plates
- Allows easy removal without the risk of aerosol formation, minimizing cross-contamination
- Convenient option for standard PCR needs

Microseal 'A' Film

Microseal 'F' Foil

- Aluminum foil allows opaque sealing option for DNA sequencing (ABI 3700 DNA analyzer) and sample storage
- Acts as a barrier against evaporation in extreme temperatures (–80 to 105°C)
- Pierceable foil for easy sample retrieval

Microseal 'F' Foil

96-Well PCR Plate Sealing Mats
These reusable mats are convenient for sealing 96-well PCR plates; they are not suitable for qPCR.

Pressure Pad
This foam pad with magnet distributes lid pressure uniformly over sealing film on plates used in thermal cyclers.

Optical Compression Pad (96-well)
This compression pad enhances the seal integrity of Microseal 'B' clear seals when used in real-time PCR detection systems.

Optical Film Sealing Kit
The sealing kits contain 100 Microseal 'B' clear seals and an optical compression pad.

For More Information
Web: bio-rad.com/pcrseals

96-Well PCR Plate Sealing Mat

Sealing Roller

Optical Compression Pad

Ordering Information

Catalog #	Description
MSC1001	**Microseal 'C' Optical Seals**, 100 pressure-sensitive adhesive seals
MSA5001	**Microseal 'A' Film**, 50 seals
MSB1001	**Microseal 'B' Adhesive Seals**, 100 optically clear seals
MSF1001	**Microseal 'F' Foil**, 100 adhesive seals
MSR0001	**Sealing Roller**, for sealing PCR plates with films
ADR3296	**Optical Compression Pad**, for improved film sealing of 96-well plates in DNA Engine Opticon 2 and Chromo4 systems
ADR5001	**Pressure Pad**, uniformly distributes lid pressure for sealing film
MSO1001	**Optical Film Sealing Kit**, for 96-well plates, includes optical compression pad, 100 Microseal 'B' clear adhesive seals
2239442	**96-Well PCR Plate Sealing Mats**, 5

Heat Sealing Films and Foils

Bio-Rad offers a family of heat sealing films and foils for use with the PX1™ PCR plate sealer. These sealing solutions help deliver consistent and reliable data by minimizing sample evaporation during thermal cycling.

For More Information
Web: bio-rad.com/heatseals
Request or download bulletin: 6257

Optically Clear Heat Seals

These clear polymer films provide a secure sealing option for PCR and real-time PCR applications. The seals are peelable pre- and post-cycling, allowing easy sample retrieval when desired. Features include:

- High light transmission, ideal for optical assays
- Low level of autofluorescence to minimize interference with qPCR detection
- Clear film enables easy inspection of sample wells
- Seal integrity from –80 to 110°C

Optically Clear Heat Seal

Permanent Clear Heat Seal

These seals provide the strongest heat sealing option and are ideal when seals will not be removed. These seals are recommended for water bath cycling. Features include:

- Strong permanent adhesive can withstand water bath cycling
- Clear film enables easy inspection of sample wells
- High solvent resistance
- Seal integrity from –80 to 110°C

Permanent Clear Heat Seal

Pierceable Foil Heat Seal

This seal provides a secure sealing option for standard PCR and Droplet Digital™ PCR (ddPCR™) applications. This pierceable foil film enables sample retrieval from select wells. Plates with pierced seals can be resealed with another pierceable foil heat seal. Features include:

- Compatible with ddPCR as validated using the QX100™/QX200™ Droplet Digital PCR system workflow
- High solvent resistance
- Colored stripe clearly identifies sealing surface
- Seal integrity from –20 to 110°C

Pierceable Foil Heat Seal

Peelable Foil Heat Seal

The peelable foil heat seal is ideal for sample storage. This seal can be easily peeled from PCR plates stored in a –80°C freezer or in liquid nitrogen. This seal is also validated for sealing PCR plates. Features include:

- Forms a peel-away seal
- Moderate solvent resistance
- Seal integrity from –200 to 110°C

Peelable Foil Heat Seal

For More Information
Web: bio-rad.com/heatseals
Request or download bulletin: 6257

See Also

PX1 PCR plate sealer: page 386.
PCR plates: page 391.

Ordering Information

Catalog #	Description
1814030	**Optically Clear Heat Seal**, package of 100
1814035	**Permanent Clear Heat Seal**, package of 100
1814040	**Pierceable Foil Heat Seal**, package of 100
1814045	**Peelable Foil Heat Seal**, package of 100

Sealing Pads for Automation

Microseal® 'P' and 'P+' Sealing Pads

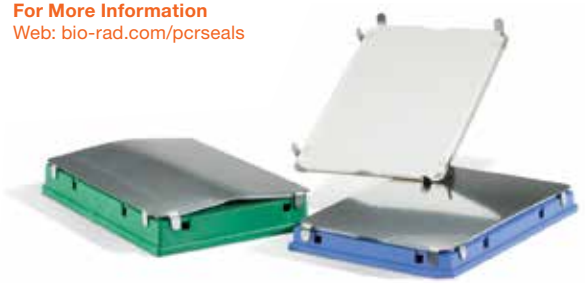
These reusable sealing pads are designed to adhere to a motorized heated lid. Use 'P' pads with Power Bonnet™ lids, and 'P+' pads with Moto Alpha™ units. Microseal 'P+' pads provide improved sealing of low-volume reactions — as low as 5 µl in 96-well plates and 1 µl in 384-well plates. Each pad may be used for approximately 25 runs.

Microseal 'P+' Sealing Pad

Auto-Sealing Lids for PCR Plates

These lids are reusable automation-friendly sealers that prevent evaporation and contamination during reaction assembly and seal tightly for thermal cycling when the cycler lid is closed. They can be reused up to 50 times. The lids are constructed of metal with an attached compressible pad. Two varieties are available: a self-releasing arched lid and an arched lid with wide tabs for robotic grippers.

For More Information
Web: bio-rad.com/pcrseals



Auto-Sealing Lids

Ordering Information

Catalog #	Description
Microseal 'P' and 'P+' Pads	
MSP1001	**Microseal 'P' Pads**, reusable, for Power Bonnet lids, 10
MSP1002	**Microseal 'P+' Pads**, reusable, for Moto Alpha unit lids, 10
MSP1003	**Microseal 'P' Replacement Pads**, for MSL-2032, reusable, 10
Auto-Sealing Lids for PCR Plates	
MSL2022	**Arched Auto-Sealing PCR Plate Lids**, reusable, 4
MSL2032	**Arched Auto-Sealing PCR Plate Lids with Wide Tabs**, reusable, 4

Chill-out™ Liquid Wax

Chill-out liquid wax provides an excellent vapor barrier that may be used instead of mineral oil in thermal cyclers without heated lids. After cycling, the tubes are chilled below 10°C to harden the wax. The solid layer protects samples from spills or aerosol formation but is easy to penetrate with a pipet tip for sample retrieval. Chill-out liquid wax is available in a clear formulation for use in fluorescence assays, such as those performed in real-time PCR, and in a bright red formulation, easily visible when recovering reaction products (not recommended for sealing Microseal® 384-well PCR plates).

For More Information
Web: bio-rad.com/pcrseals

Ordering Information

Catalog #	Description
CHO1401	**Chill-out Liquid Wax**, red, 100 ml
CHO1404	**Chill-out Liquid Wax**, red, 1 L
CHO1411	**Chill-out Liquid Wax**, clear, optical grade, 100 ml
CHO1414	**Chill-out Liquid Wax**, clear, optical grade, 1 L

Frame-Seal™ Incubation Chambers

Frame-Seal incubation chambers are easy-to-use, strongly adhesive hybridization chambers with flexible plastic coverslips. They provide vapor-tight sealing for FISH, polonies, in situ PCR, and PRINS and allow samples to be recovered easily. The seal withstands temperatures up to 97°C. Frame-Seal chambers should be used with plain (unprinted) glass slides. Slides with highly hydrophobic ink patterns are not recommended for use with Frame-Seal chambers. They are UV-treatable for inactivation of contaminating DNA.

For More Information
Web: bio-rad.com/pcrseals

Ordering Information

Catalog #	Description
SLF0201	**Frame-Seal Incubation Chambers**, 9 x 9 mm, 25 µl capacity, coverslips included, 100
SLF0601	**Frame-Seal Incubation Chambers**, 15 x 15 mm, 65 µl capacity, coverslips included, 100
SLF1201	**Frame-Seal Incubation Chambers**, 17 x 28 mm, 125 µl capacity, coverslips included, 100
SLF3001	**Frame-Seal Incubation Chambers**, 19 x 60 mm, 300 µl capacity, coverslips included, 100

Subject Index