



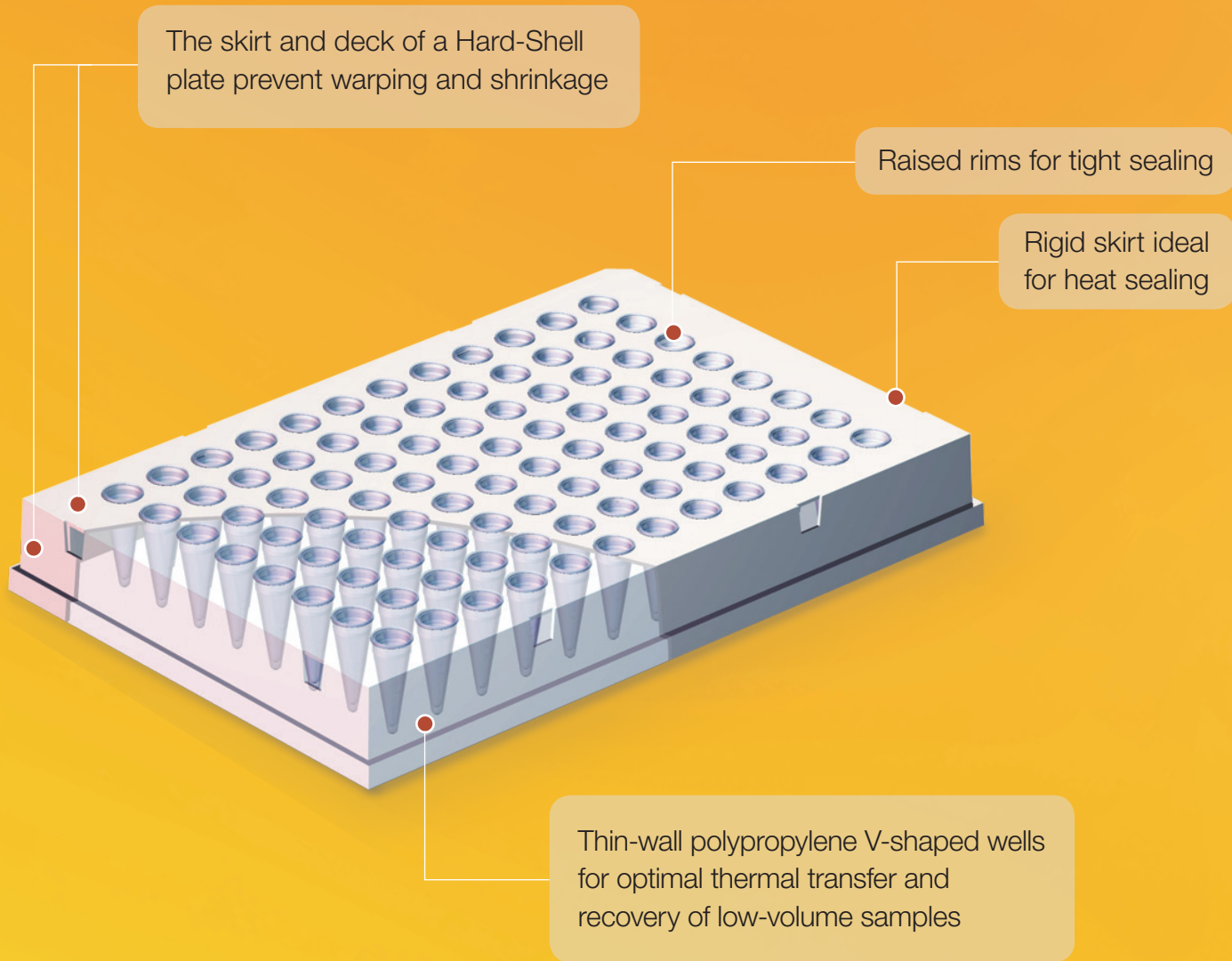
Hard-Shell® PCR Plates



# Two-Component Design for Superior Uniformity and Precise Handling

Hard-Shell PCR plates are specifically designed to withstand the stresses of thermal cycling, robotic handling, and heat sealing. They represent an innovative concept in PCR plate design. The skirt and deck are molded from a rigid thermostable polymer, preventing robotic handling problems due to plate warping. This hard shell prevents the distortion and shrinkage that may occur when regular single-component polypropylene PCR plates are exposed to the high temperatures of thermal cycling or heat sealing. The thin-wall wells are molded of virgin polypropylene selected for low DNA binding. The raised rims around each well allow tight sealing using a variety of procedures, including [pressure-](#), [adhesive-](#), and [heat-sealing](#) methods.



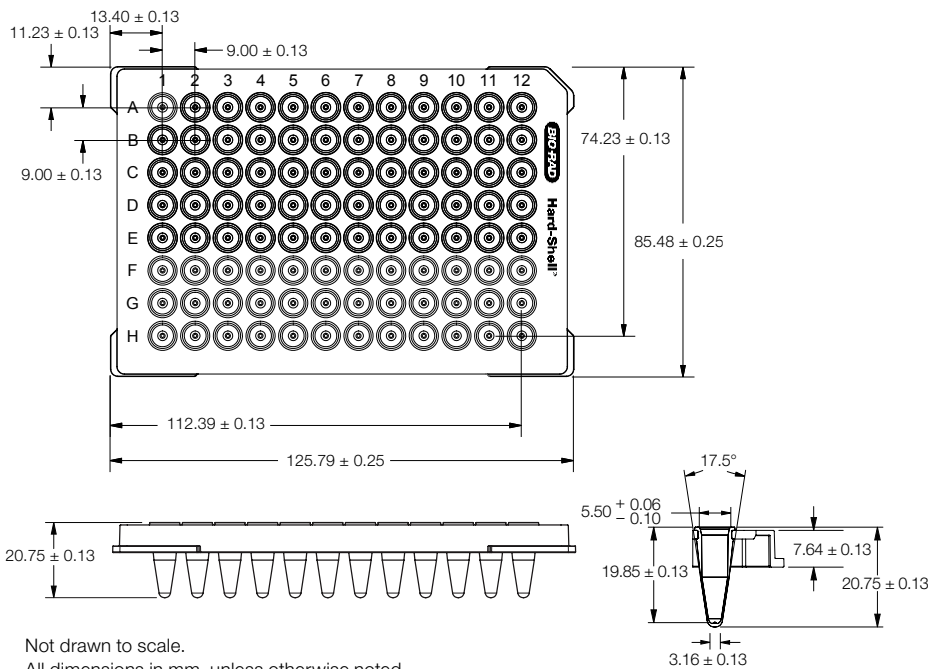


### Key Plate Features

- Thin wall for fast PCR
- [6 plate styles](#) that fit most thermal cyclers, real-time PCR detection systems, DNA sequencers, and plate readers
- White-well option, which allows increased fluorescent signal strength
- Color-coded skirts available
- Superior stability and flatness, allowing precise positioning for automation
- Extremely uniform wells that reduce well-to-well variability in optical assays, such as those performed in real-time PCR
- Free of DNase, RNase, and human DNA
- ANSI/SBS standard dimensions
- Black or white alphanumeric labeling for easy well identification
- Low-cost, user-readable bar codes to enable convenient database tracking

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

- High-profile wells that fit most thermal cyclers, real-time PCR detection systems, and DNA sequencers
- Half-height skirt for stiffness and labeling surface
- Black lettering for easy well identification



Microplate Dimensions	Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates (HSS-9xxx)
Length at top plane	125.79 mm
Width at top plane	85.48 mm
Height overall	20.75 mm
Well depth	19.85 mm
Well diameter at opening	5.50 mm
Well diameter at bottom of conical section	3.16 mm
Well volume	350 µl
Well spacing	9.00 mm
Well angle	17.5°
Well offset	
Left edge to well A1	13.40 mm
Top edge to well A1	11.23 mm
Center of A1 to center of A12	99.0 ± 0.25 mm
Center of A1 to center of H1	63.0 ± 0.25 mm

## Ordering Information

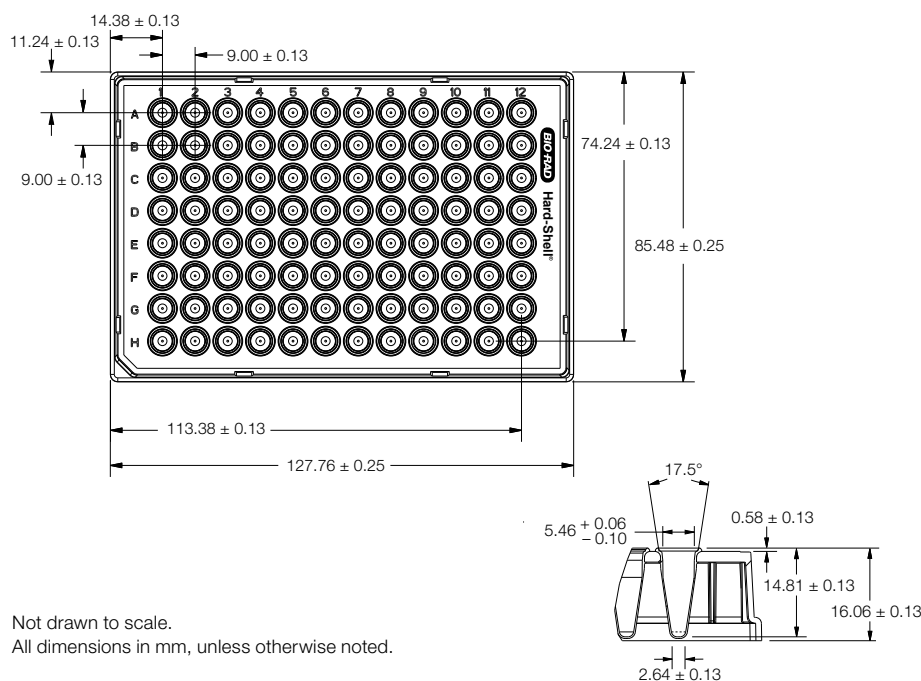
Catalog #	Description
<a href="#">HSS-9601</a>	Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates, clear well, clear shell, 25
<a href="#">HSS-9641</a>	Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates, clear well, green shell, 25
<a href="#">HSS-9901</a>	Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates, clear well, clear shell, bar-coded, 25
<a href="#">HSS-9665</a>	Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates, white well, black shell, 25

## PCR Sealers

<a href="#">TCS-0801</a>	Domed 8-Cap Strips, for tubes and plates, clear, 120 strips
<a href="#">TCS-0803</a>	Optical Flat 8-Cap Strips, for tubes and plates, ultraclear, 120 strips
<a href="#">MSB-1001</a>	Microseal® 'B' Adhesive Seals, optically clear, 100 seals
<a href="#">MSC-1001</a>	Microseal 'C' Optical Seals, 100 adhesive seals
<a href="#">181-4000</a>	PX1™ PCR Plate Sealer, heat sealing instrument
<a href="#">181-4030</a>	Optically Clear Heat Seal, for use with PX1 PCR plate sealer, 100 seals

## Low-Profile 96-Well Skirted PCR Plates

- Low-profile wells optimized for low-volume reactions and fast PCR
- Full skirt for robotic handling and labeling surface
- Footprint and well spacing match ANSI/SBS standard dimensions



Microplate Dimensions		Hard-Shell Low-Profile 96-Well Skirted PCR Plates (HSP-9xxx)
Length at base plane		127.76 mm
Width at base plane		85.48 mm
Height overall		16.06 mm
Well depth		14.81 mm
Well diameter at opening		5.46 mm
Well diameter at bottom of conical section		2.64 mm
Well volume		200 $\mu$ l
Well spacing		9.00 mm
Well angle		17.5°
Well offset		
Left edge to well A1		14.38 mm
Top edge to well A1		11.24 mm
Left edge to H12		113.38 mm
Top edge to H12		74.24 mm

### Ordering Information

Catalog # Description

#### Hard-Shell Low-Profile 96-Well Skirted PCR Plates, 50

Clear Wells	White Wells	Black Wells	Shell Color
HSP-9601	HSP-9655	—	White shell
HSP-9611	—	—	Red shell
HSP-9621	—	—	Yellow shell
HSP-9631	HSP-9635	—	Blue shell
HSP-9641	HSP-9645	—	Green shell
HSP-9661	HSP-9665	HSP-9666	Black shell
HSP-9901	HSP-9955	—	White shell, bar-coded

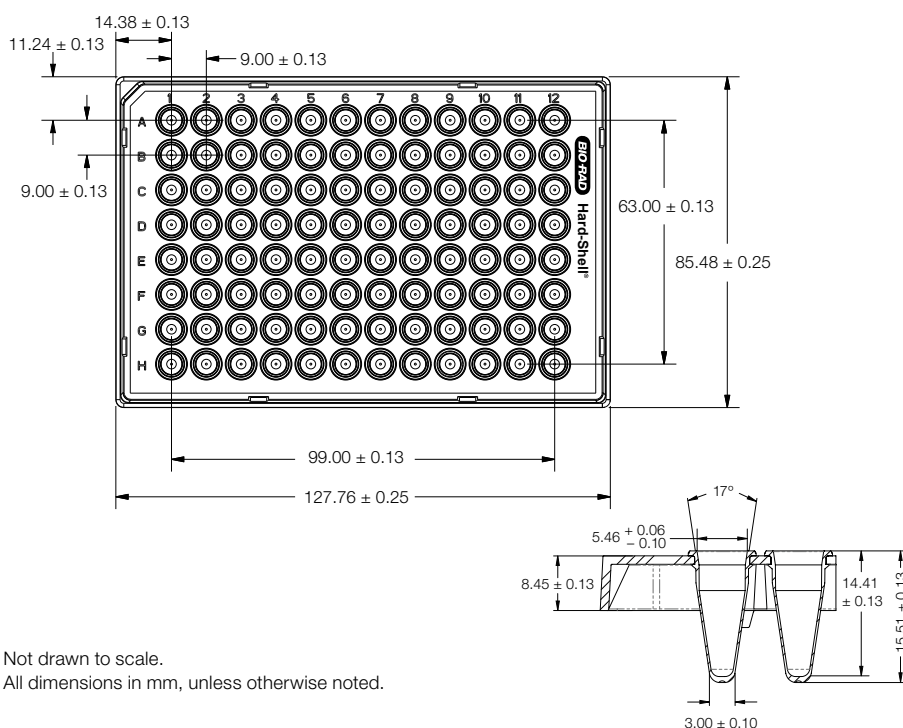
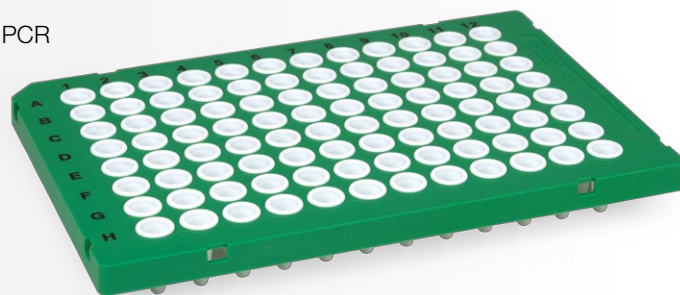
#### PCR Sealers

TCS-0801	Domed 8-Cap Strips, for tubes and plates, clear, 120 strips
TCS-0803	Optical Flat 8-Cap Strips, for tubes and plates, ultraclear, 120 strips
MSB-1001	Microseal 'B' Adhesive Seals, optically clear, 100 seals
MSC-1001	Microseal 'C' Optical Seals, 100 adhesive seals
181-4000	PX1 PCR Plate Sealer, heat sealing instrument
181-4030	Optically Clear Heat Seal, for use with PX1 PCR plate sealer, 100 seals



## Low-Profile 96-Well Semi-Skirted PCR Plates

- Low-profile wells optimized for low-volume reactions and fast PCR
- Semi-skirt design for optimal fit in Applied Biosystems 7500 fast and ViiA 7 fast instruments
- Rigid skirt ideal for robotic handling
- Rigid plate materials ideal for heat sealing
- Footprint and well spacing match ANSI/SBS standard dimensions



Microplate Dimensions	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates (HSL-9xxx)
Length at base plane	127.76 mm
Width at base plane	85.48 mm
Height overall	15.51 mm
Well depth	14.41 mm
Well diameter at opening	5.46 mm
Well diameter at bottom of conical section	3.00 mm
Well volume	200 µl
Well spacing	9.00 mm
Well angle	17.0°
Well offset	
Left edge to well A1	14.38 mm
Top edge to well A1	11.24 mm
Center of A1 to center of A12	99.00 mm
Center of A1 to center of H1	63.00 mm

### Ordering Information

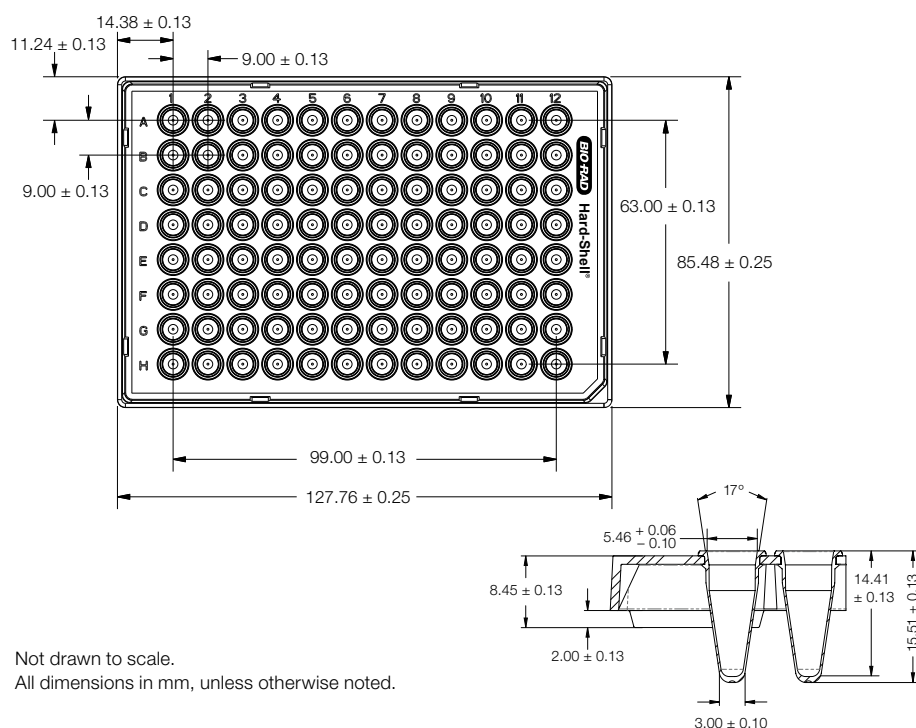
Catalog #	Description
<a href="#">HSL-9601</a>	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, clear well, clear shell, 25
<a href="#">HSL-9901</a>	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, clear well, clear shell, bar-coded, 25
<a href="#">HSL-9641</a>	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, clear well, green shell, 25
<a href="#">HSL-9605</a>	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, white well, clear shell, 25
<a href="#">HSL-9905</a>	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, white well, clear shell, bar-coded, 25
<a href="#">HSL-9645</a>	Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates, white well, green shell, 25

### PCR Sealers

<a href="#">TCS-0801</a>	Domed 8-Cap Strips, for tubes and plates, clear, 120 strips
<a href="#">TCS-0803</a>	Optical Flat 8-Cap Strips, for tubes and plates, ultraclear, 120 strips
<a href="#">MSB-1001</a>	Microseal 'B' Adhesive Seals, optically clear, 100 seals
<a href="#">MSC-1001</a>	Microseal 'C' Optical Seals, 100 adhesive seals
<a href="#">181-4000</a>	PX1 PCR Plate Sealer, heat sealing instrument
<a href="#">181-4030</a>	Optically Clear Heat Seal, for use with PX1 PCR plate sealer, 100 seals

## 96-Well 480 PCR Plates

- Specifically designed and optimized for the Roche LightCycler 480 real-time PCR system
- Warp-free skirt and deck for improved robotic handling
- Footprint and well spacing match ANSI/SBS standard dimensions
- Rigid plate materials ideal for heat sealing
- Bar-coded on row A side
- Available in clear or white well



### Hard-Shell 96-Well 480 PCR Plates (HSR-99xx)

#### Microplate Dimensions

Length at base plane	127.76 mm
Width at base plane	85.48 mm
Height overall	15.51 mm
Well depth	14.41 mm
Well diameter at opening	5.46 mm
Well diameter at bottom of conical section	3.00 mm
Well volume	200 µl
Well spacing	9.00 mm
Well angle	17.0°
Well offset	
Left edge to well A1	14.38 mm
Top edge to well A1	11.24 mm
Center of A1 to center of A12	99.00 mm
Center of A1 to center of H1	63.00 mm

### Ordering Information

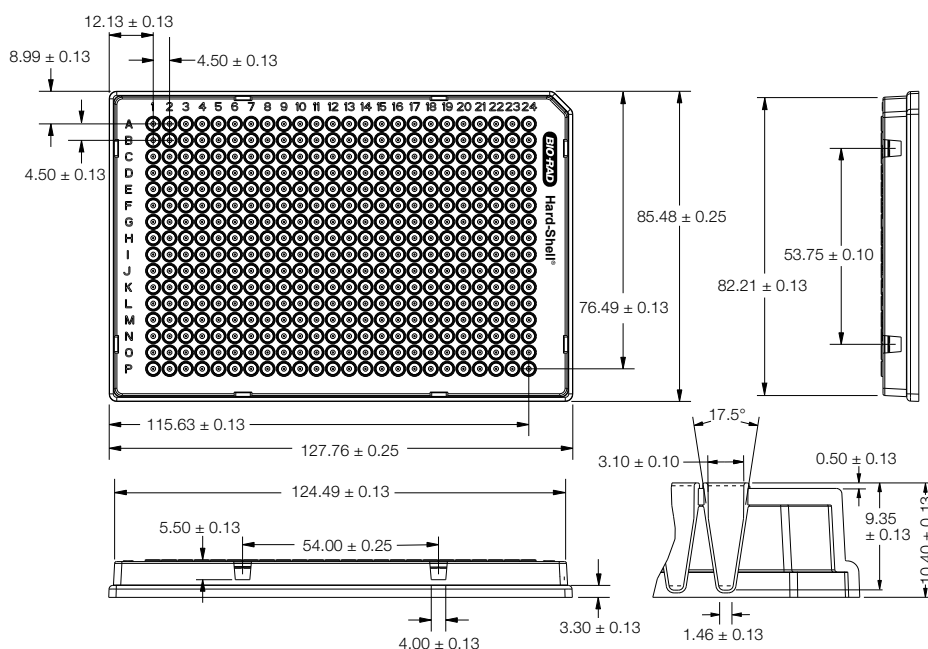
Catalog #	Description
<a href="#">HSR-9905</a>	<b>Hard-Shell 96-Well 480 PCR Plates</b> , white well, clear shell, bar-coded, 25
<a href="#">HSR-9905K</a>	<b>Hard-Shell 96-Well 480 PCR Plates and Seals</b> , white well, clear shell, bar-coded, 100 plates and 100 Microseal 'C' optical seals
<a href="#">HSR-9901</a>	<b>Hard-Shell 96-Well 480 PCR Plates</b> , clear well, clear shell, bar-coded, 25
<a href="#">HSR-9901K</a>	<b>Hard-Shell 96-Well 480 PCR Plates and Seals</b> , clear well, clear shell, bar-coded, 100 plates and 100 Microseal 'C' optical seals

### PCR Sealers

<a href="#">TCS-0801</a>	<b>Domed 8-Cap Strips</b> , for tubes and plates, clear, 120 strips
<a href="#">TCS-0803</a>	<b>Optical Flat 8-Cap Strips</b> , for tubes and plates, ultraclear, 120 strips
<a href="#">MSB-1001</a>	<b>Microseal 'B' Adhesive Seals</b> , optically clear, 100 seals
<a href="#">MSC-1001</a>	<b>Microseal 'C' Optical Seals</b> , 100 adhesive seals
<a href="#">181-4000</a>	<b>PX1 PCR Plate Sealer</b> , heat sealing instrument
<a href="#">181-4030</a>	<b>Optically Clear Heat Seal</b> , for use with PX1 PCR plate sealer, 100 seals

## 384-Well Standard PCR Plates

- Compatible with most 384-well thermal cyclers, real-time PCR detection systems, and DNA sequencers
- Warp-free skirt and deck for improved robotic handling
- Footprint and well spacing match ANSI/SBS standard dimensions



Not drawn to scale.  
All dimensions in mm, unless otherwise noted.

### Microplate Dimensions

Microplate Dimensions	Hard-Shell 384-Well Standard PCR Plates (HSP-3xxx)
Length at base plane	127.76 mm
Width at base plane	85.48 mm
Height overall	10.40 mm
Well depth	9.35 mm
Well diameter at opening	3.10 mm
Well diameter at bottom of conical section	1.46 mm
Well volume	50 $\mu$ l
Well spacing	4.50 mm
Well angle	17.5°
Well offset	
Left edge to well A1	12.13 mm
Top edge to well A1	8.99 mm
Left edge to P24	115.63 mm
Top edge to P24	76.49 mm

### Ordering Information

Catalog # Description

#### Hard-Shell 384-Well Standard PCR Plates, 50

Clear Wells	White Wells	Black Wells	Shell Color
<a href="#">HSP-3801</a>	<a href="#">HSP-3805</a>	—	Clear shell
<a href="#">HSP-3811</a>	—	—	Red shell
<a href="#">HSP-3821</a>	—	—	Yellow shell
<a href="#">HSP-3831</a>	—	—	Blue shell
<a href="#">HSP-3841</a>	—	—	Green shell
—	<a href="#">HSP-3865</a>	<a href="#">HSP-3866</a>	Black shell
<a href="#">HSP-3901</a>	<a href="#">HSP-3905</a>	—	Clear shell, bar-coded

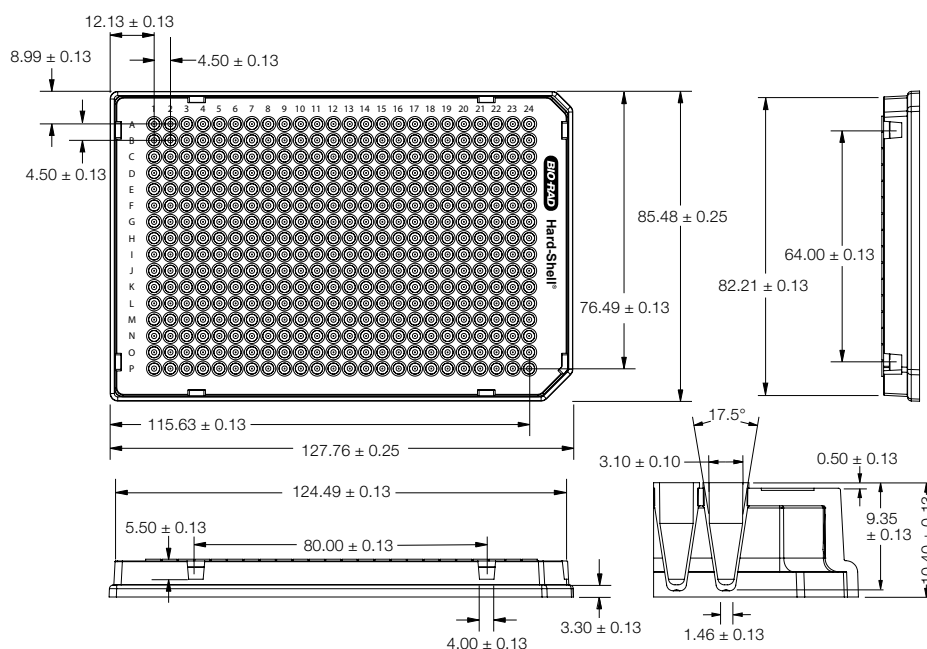
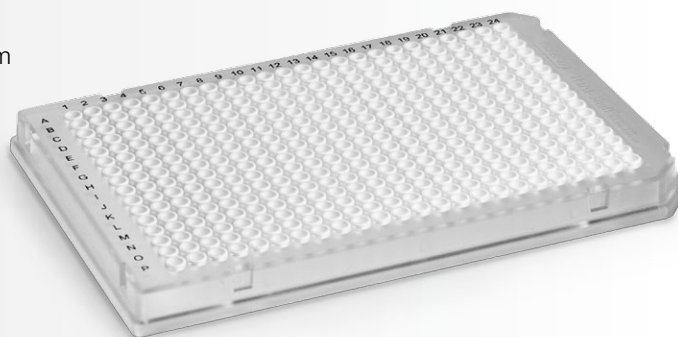
#### PCR Sealers

<a href="#">TCS-0801</a>	Domed 8-Cap Strips, for tubes and plates, clear, 120 strips
<a href="#">TCS-0803</a>	Optical Flat 8-Cap Strips, for tubes and plates, ultraclear, 120 strips
<a href="#">MSB-1001</a>	Microseal 'B' Adhesive Seals, optically clear, 100 seals
<a href="#">MSC-1001</a>	Microseal 'C' Optical Seals, 100 adhesive seals
<a href="#">181-4000</a>	PX1 PCR Plate Sealer, heat sealing instrument
<a href="#">181-4030</a>	Optically Clear Heat Seal, for use with PX1 PCR plate sealer, 100 seals



## 384-Well 480 PCR Plates

- Designed for Roche LightCycler 480 real-time PCR system
- Warp-free skirt and deck for improved robotic handling
- Footprint and well spacing match ANSI/SBS standard dimensions
- Bar-coded on row A side
- Available in clear or white well



Not drawn to scale.  
All dimensions in mm, unless otherwise noted.

### Hard-Shell 384-Well 480 PCR Plates (HSR-48xx)

#### Microplate Dimensions

Length at base plane	127.76 mm
Width at base plane	85.48 mm
Height overall	10.40 mm
Well depth	9.35 mm
Well diameter at opening	3.10 mm
Well diameter at bottom of conical section	1.46 mm
Well volume	50 µl
Well spacing	4.50 mm
Well angle	17.5°
Well offset	
Left edge to well A1	12.13 mm
Top edge to well A1	8.99 mm
Left edge to P24	115.63 mm
Top edge to P24	76.49 mm



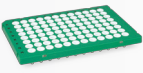



### Ordering Information

Catalog #	Description
<a href="#">HSR-4805</a>	<b>Hard-Shell 384-Well 480 PCR Plates</b> , white well, clear shell, bar-coded, 50
<a href="#">HSR-4805K</a>	<b>Hard-Shell 384-Well 480 PCR Plates and Seals</b> , white well, clear shell, bar-coded, 100 plates and 100 Microseal 'C' optical seals
<a href="#">HSR-4801</a>	<b>Hard-Shell 384-Well 480 PCR Plates</b> , clear well, clear shell, bar-coded, 50
<a href="#">HSR-4801K</a>	<b>Hard-Shell 384-Well 480 PCR Plates and Seals</b> , clear well, clear shell, bar-coded, 100 plates and 100 Microseal 'C' optical seals

### PCR Sealers

<a href="#">TCS-0801</a>	<b>Domed 8-Cap Strips</b> , for tubes and plates, clear, 120 strips
<a href="#">TCS-0803</a>	<b>Optical Flat 8-Cap Strips</b> , for tubes and plates, ultraclear, 120 strips
<a href="#">MSB-1001</a>	<b>Microseal 'B' Adhesive Seals</b> , optically clear, 100 seals
<a href="#">MSC-1001</a>	<b>Microseal 'C' Optical Seals</b> , 100 adhesive seals
<a href="#">181-4000</a>	<b>PX1 PCR Plate Sealer</b> , heat sealing instrument
<a href="#">181-4030</a>	<b>Optically Clear Heat Seal</b> , for use with PX1 PCR plate sealer, 100 seals

# Hard-Shell PCR Plate Compatibility Chart

	 <a href="#">High-Profile 96-Well Semi-Skirted Plates</a>	 <a href="#">Low-Profile 96-Well Skirted Plates</a>	 <a href="#">Low-Profile 96-Well Semi-Skirted Plates</a>	 <a href="#">96-Well 480 Plates</a>	 <a href="#">384-Well Standard Plates</a>	 <a href="#">384-Well 480 Plates</a>
Catalog number	HSS-9xxx	HSP-9xxx	HSL-9xxx	HSR-99xx	HSP-3xxx	HSR-48xx
Well height	High-profile	Low-profile	Low-profile	Low-profile	Standard 384-well height	Standard 384-well height
Skirt	Semi-skirted	Full-skirted	Semi-skirted	Semi-skirted	Full-skirted	Full-skirted
ANSI/SBS standard dimensions	Yes	Yes	Yes	Yes	Yes	Yes
<b>Thermal Cycler Compatibility</b>						
Bio-Rad® C1000™, C1000 Touch™, and S1000™	●	●	●		●	●
Bio-Rad® T100™	●					
Bio-Rad® DNA Engine®, DNA Engine Tetrad® and Tetrad 2, DNA Engine Dyad®, Dyad Disciple™	●	●			●	●
Bio-Rad® iCycler®	●				●	●
Bio-Rad® PTC-100®	●	●				
Applied Biosystems cyclers with standard blocks	●				●	●
Applied Biosystems cyclers with fast blocks (9800 fast, Veriti fast)			●			
Eppendorf Mastercycler series	●	●	●		●	●
<b>Real-Time PCR Detection System Compatibility</b>						
Bio-Rad® CFX Connect™, CFX96™, CFX96 Touch™, CFX384™, CFX384 Touch™		●	●		●	●
Bio-Rad® CFX96 Touch Deep Well™	●	●				
Bio-Rad® iCycler iQ®, iQ™5, MyiQ™, MyiQ™2	●					
Bio-Rad® Chromo4™	●	●				
Bio-Rad® DNA Engine Opticon® and Opticon 2		●				
Applied Biosystems systems with standard blocks (7300, 7500, 7900HT, ViiA 7)	● Except ViiA 7				●	●
Applied Biosystems systems with fast blocks (7500 fast, ViiA 7 fast)			●			
Roche LightCycler 480				●		●
Eppendorf Mastercycler ep realplex	●	●	●			
Stratagene Mx series	●					
<b>Other Instrument Compatibility</b>						
Applied Biosystems DNA sequencers (3700, 3730, etc.)	●				●	
Idaho Technology LightScanner		●			●	

Eppendorf and Mastercycler are trademarks of Eppendorf AG. LightCycler is a trademark of Roche Diagnostics GmbH. LightScanner is a trademark of Idaho Technology Inc. Mx is a trademark of Stratagene Corporation. Veriti is a trademark of Applied Biosystems Corporation. ViiA is a trademark of Life Technologies Corporation.

Hard-Shell plates are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 7,347,977; 6,340,589; and 6,528,302.

Notice regarding Bio-Rad thermal cyclers and real-time systems:

Purchase of this instrument conveys a limited non-transferable immunity from suit for the purchaser's own internal research and development and for use in human in vitro diagnostics and all other applied fields under U.S. Patent Number 5,475,610 (Claims 1, 44, 158, 160-163, and 167 only), or corresponding claims in its non-U.S. counterpart, owned by Applied Biosystems Corporation. No right is conveyed expressly, by implication, or by estoppel under any other patent claim, such as claims to apparatus, reagents, kits, or methods such as 5' nuclease methods. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

Bio-Rad's real-time thermal cyclers are licensed real-time thermal cyclers under Applied Biosystems' U.S. Patent Number 6,814,934 B1 for use in research, human in vitro diagnostics, and all other fields except veterinary diagnostics.

Bio-Rad's thermal cyclers and real-time thermal cyclers are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 6,767,512 and 7,074,367.





**BIO-RAD**

**Bio-Rad  
Laboratories, Inc.**

Life Science  
Group

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**France** 01 47 95 69 65 **Germany** 089 31 884 0 **Greece** 30 210 9532 220 **Hong Kong** 852 2789 3300 **Hungary** 36 1 459 6100 **India** 91 124 4029300  
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