Hard-Shell® 96-Well Thin-Wall PCR Plates

Optimized for Automation and Thermal Cycling

Hard-Shell PCR plates represent a new concept in PCR plate design (US patent 6,340,589). The skirt and deck are molded from a rigid, thermostable polymer that completely resists the warping and shrinkage experienced with traditional one-component PCR plates. In a separate step, the thin-wall wells are molded of virgin polypropylene selected for low DNA binding. This unique two-component design offers many advantages for the high-throughput laboratory as well as flexibility to fit diverse applications. The footprint and well spacing meet ANSI-SBS standards 1-2004 and 4-2004. Raised rims around each well allow tight sealing with a wide variety of sealing systems. Recommended thermal cycling volumes are 5-100 µl for 96-well plates. The plates have been certified free of DNase, RNase, and human DNA.

Hard-Shell PCR plate design prevents problems due to warping, shrinkage, and sticking. Flat plates mean that accurate low-volume automated pipetting is possible with no need for special adaptors. Stable well-to-well spacing improves the accuracy of automated pipetting and eliminates problems due to plates sticking in the block. V-shaped wells with rounded bottoms provide maximal recovery of low-volume samples.

Rigid skirt improves robotic handling. Stackers and robotic arms can grip and move Hard-Shell plates securely and reliably.

Ideal for optical assays. Flat plates give more uniform signals. Choose clear, white, or black wells to suit your needs. For example, use white wells with black shells to maximize fluorescent signal and minimize cross talk. Use black wells for fluorescence polarization.

Alcohol precipitation. Hard-Shell plates withstand centrifugation forces even when stacked in plate rotors. Maximum sample capacity is 150 µl for 96-well plates, which allows convenient alcohol precipitation of nucleic acids.

New options for color coding. The two-component design means you can color code lab processes without sacrificing the convenience of clear wells.

Hard-Shell 96-Well PCR Plates 8 x 12 well array, 50 plates/pkg

HSP-9601	Clear well, white shell	HSP-9625	White well, yellow shell
HSP-9661	Clear well, black shell	HSP-9635	White well, blue shell
HSP-9611	Clear well, red shell	HSP-9645	White well, green shell
HSP-9621	Clear well, yellow shell	HSP-9656	Black well, white shell
HSP-9631	Clear well, blue shell	HSP-9666	Black well, black shell
HSP-9641	Clear well, green shell		
HSP-9655	White well, white shell		
HSP-9615	White well, red shell		
HSP-9665	White well, black shell		

Please inquire for availability and catalog numbers for bar-coded Hard-Shell PCR plates, or for color combinations not shown above.

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Recommended Sealing Options for Hard-Shell 96-Well Plates

Product	Product Highlights	Compatibility
Strip caps TCS-series	• Tight sealing for thermal cycling, storage, or transport • Choice of dome caps or ultraclear, flat optical caps • PCR volumes ≥5 µl	96-well polypropylene PCR plates and 0.2 ml tubes
Microseal® 'A' film MSA-5001 (50 sheets)	• Smooth application and release — no aerosol generation • Peel-away release liner for pristine sealing surface • PCR volumes ≥10 µl (96-well) or ≥5 µl (384-well)	All PCR plates, tube strips
Microseal 'B' adhesive seals MSB-1001 (100 sheets)	• Clear adhesive seal for thermal cycling or fluorescent assays • Plate storage or transport before or after cycling (ambient to –40°C) • PCR volumes ≥10 µl (96-well) or ≥5 µl (384-well)	All polypropylene PCR plates
Microseal 'F' foil MSF-1001 (100 sheets)	• Foil can be pierced for sample recovery • Plate storage (ambient to –70°C) • PCR volumes ≥25 µl (96-well) or ≥5 µl (384-well)	All PCR plates
96-well PCR plate sealing mats 223-9442 (5 mats)	• Reusable mat — ideal for sequencing • Smooth release — no aerosol generation • PCR volumes ≥10 µl	96-well polypropylene PCR plates
Chill-out™ liquid wax, red or clear CHO-series	• Replaces mineral oil overlay — solidifies below 10°C for easy sample recovery • Protects samples from spills or aerosol formation during chilled transport • Clear Chill-out overlay is ideal for reading fluorescent assays • PCR volumes ≥2 µl	All tubes, 96-well PCR plates, Hard-Shell 384-well PCR plates
Microseal 'P' and 'P+' Pads MSP-1001 MSP-1002 (10 pads)	• Reusable sealing pad adheres to the heated lid • Use MSP-1001 with Power Bonnet™ motorized lid (ALP-1296, ALP-1238), using PCR volumes ≥15 µl (96-well) or ≥10 µl (384-well) • Use MSP-1002 with Moto Alpha™ motorized lid (ALP-2296, ALP-2238), using PCR volumes ≥10 µl (96-well) or ≥5 µl (384-well)	All 384-well and 96-well PCR plates with raised well rims
Auto-sealing lids MSL-2012 (flat) MSL-2022 (arched) MSL-2032 (arched, wide-tab) (4 lids)	• Reusable, robot-placeable sealer reduces evaporation during reaction assembly and seals tightly during thermal cycling • Flat lid can be used for postcycling storage; PCR volumes ≥3 µl (96-well) or ≥1 µl (384-well) • Arched lids can be removed by robotic arms; PCR volumes ≥5 µl (96-well) or ≥1 µl (384-well)	Hard-Shell and Microseal skirted PCR plates

Instrument Compatibility

Hard-Shell skirted PCR plates fit all Bio-Rad 96-well Alpha™ units and many other 96-well instruments. They also fit the BaseStation® DNA fragment analyzer and a wide variety of automated laboratory workstations and robotic plate handlers.

This product was process-sampled and has tested negative for RNase, DNase, and human DNA. Please contact Bio-Rad Laboratories, Inc. for details of the testing procedure.

Practice of the patented polymerase chain reaction (PCR) process requires a license. Bio-Rad and MJ brand thermal cyclers and systems include an Authorized Thermal Cycler and may be used with PCR licenses available from Applied Biosystems. Their use with Authorized Reagents also provides a limited PCR license in accordance with the label rights accompanying such reagents. Some applications may also require licenses from other third parties.

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