

# Precision manufacturing in plastics

OEM PCR and qPCR Plastics Guide

**ThermoFisher**  
SCIENTIFIC

# Accuracy and reproducibility

For more than 25 years, we've been at the forefront of innovation in the manufacturing of high-grade plastic consumables, with a focus on providing plastic solutions for molecular biology applications, including PCR and qPCR. The quality and reliability of our products enable you, our customer, to help ensure the accuracy, reproducibility, and validity of your biological data.

## We have the essentials to help ensure that your development and manufacturing projects are a success

- State-of-the-art injection molding manufacturing facilities
- Custom development teams help rapidly take ideas from concept through design, prototyping, toolmaking, molding, quality control, and logistics
- Expertise in manufacturing with a wide range of polymers
- Product assembly and packing know-how to deliver what you need, with the option to either receive white-box products or to define your own requirements for custom manufacturing, barcoding, packaging, and/or labeling
- Quality systems to respond to your evolving requirements with rigorous documentation for the supply chain, manufacturing, and quality control processes
- Dedicated account representatives to provide you with world-class customer service

## Manufacturing designed to eliminate contaminants at the source, providing you with peace of mind

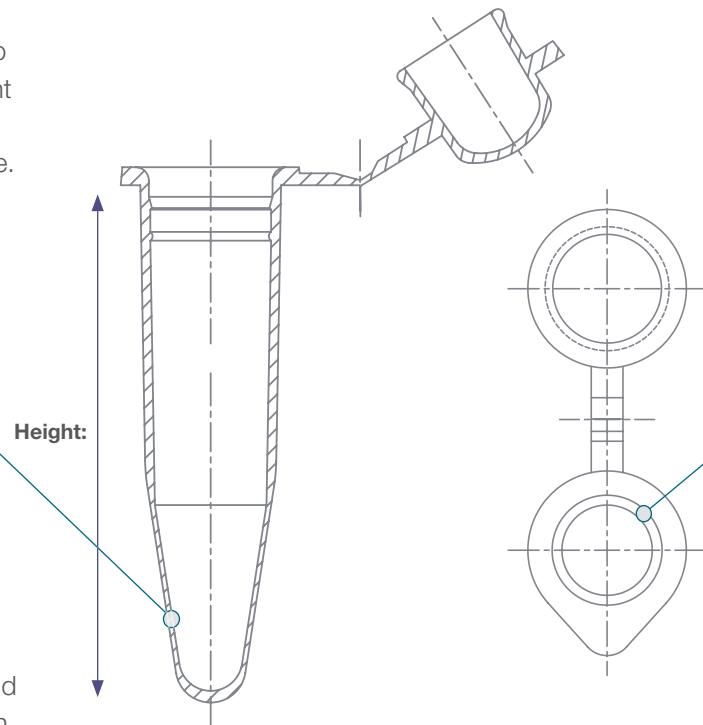
- All plastic consumables are produced in injection-molding facilities that meet 10,000 or 100,000 clean room (ISO 4 or 5 clean room) standards
- Virgin polypropylene
- Primary packaging is contained within a class 10,000 or 100,000 clean room
- Production runs 24/7 according to ISO 9001 guidelines, with complete traceability and process controls



# Innovative product design

## High efficiency, reduced variability

Uniform, ultrathin well walls help deliver maximum and consistent heat transfer for equally high performance from every sample.

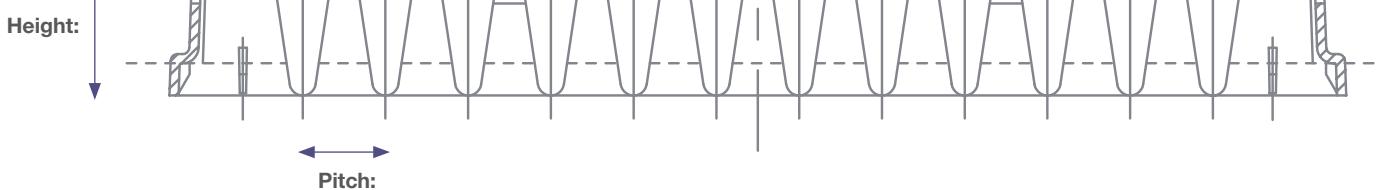


## White plastics for enhanced qPCR detection

White qPCR plastics are designed to enable sensitive and accurate fluorescence detection by preventing refraction out of the tube and increasing the signal-to-noise ratio.

## Secure, easy sealing

Specially designed caps create a tight seal that is still easy to open and close.



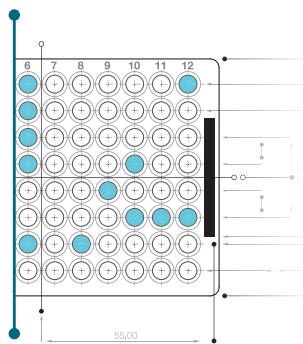
## Evaporation protection

Raised rim design around each well enables secure sealing, and safeguards against evaporation.

# Definitive quality control, adapted to your needs

We are ISO 9001–registered, and our quality systems are the cornerstone of our business. Among our rigorous standards of product testing and process controls, we adhere to comprehensive standard operating procedures (SOPs). This includes referencing to assay testing; plastic integrity testing; 24/7 roving QC patrols to help ensure procedural adherence; equipment qualification; process verification; and validation. A controlled raw material supply chain and established vendor partnerships help ensure consistency and security of supply.

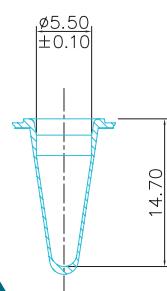
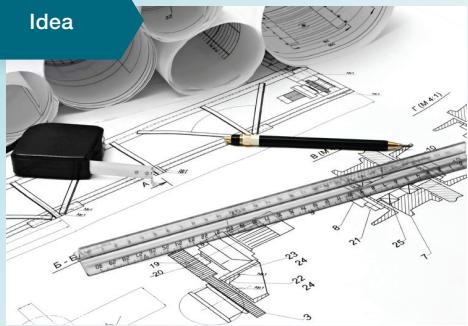
- Time-and-date batch segregation of every production run prior to QA release
- On-site coordinate-measuring machines help ensure that tools and moldings adhere to specified product tolerances
- Formalized change control process to help ensure consistency, compliance, and conformance of materials
- Raw material and vendor qualifications that provide security of supply
- Corrective and preventative action systems
- Application-specific testing helps ensure product performance in functional assays; e.g., qPCR/PCR testing, centrifugation, and sealing/storage conditions
- Our employees use these systems in day-to-day activities and take great pride in consistently meeting our customers' requirements and exceeding your expectations for service
- We encourage customers to tour and audit our OEM facilities



Make us a part of your team: contact our licensing and commercial supply specialists at  
**[thermofisher.com/oemplastics](http://thermofisher.com/oemplastics)**

1

Idea



2

Technical  
product  
drawing

3

3D prototype  
of product



4

Mold design  
and assembly



5

Manufacturing



6

Quality  
control



7

Custom  
packaging



8

Finished  
product



# Custom products

Your product can be tailored to meet both the application and your customer's needs, from the product itself to the label on the box.

## Product

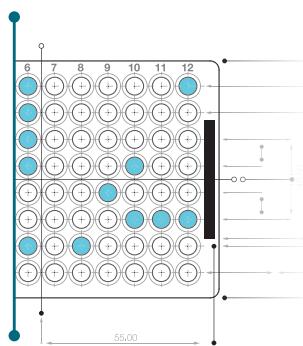
- Off-the-shelf options are available for most life science consumables: PCR tubes, strip tubes, 24- to 384-well PCR plates, and a wide range of plate seals
- Any of the off-the-shelf products can be customized to individual requirements, including colored lettering, unique adhesive seal formats, and additional colored stripes on tube strip end tabs, which can be used to indicate different diagnostic tests
- If none of the existing products match your instrument or application, our R&D team will work with you to understand all the product requirements and design a consumable that uniquely fits your platform

## Product format

- Standard pack sizes are available for off-the-shelf products; individually wrapped, handy small pack sizes or bulk options are available for high-throughput users
- All of the products can be supplied in any pack size, from a kit-ready custom component bag containing 5 seals bearing a lot number label to a pack of 5,000 strip tubes ready for reagent loading in your facility

## Packaging

- Our standard products are supplied in white boxes with plain, nonbranded labels
- All OEM products can be supplied with any or all of the following customized components:
  - Labels printed in our manufacturing site or supplied to us ready for the final packaging stage
  - Unique lot numbers
  - Product information inserts
  - Certificates of conformity
  - Outer packaging from specific finish to box design



Make us a part of your team: contact our licensing and commercial supply specialists at  
**[thermofisher.com/oemplastics](http://thermofisher.com/oemplastics)**

# Custom design and prototypes

Existing clients spanning the diagnostics, therapeutics, and research markets value our expertise in new product design and prototyping. Our design team delivers creativity with the ability to produce reliable and accurate plastic solutions for scientific applications. The team has an excellent record in bringing innovative, profitable, and highly engineered products to market within customer-defined time frames. Communication is the key. Our designers, engineers, and molecular biologists are ready to listen to your team so we can develop products that meet—and perhaps exceed—your expectations.

## Tools we use to design your products

- Premold conceptual designs using SOLIDWORKS™ 3D CAD software
- Computer-generated stereo lithography apparatus (SLA) to create solid, plastic, 3D objects from CAD drawings
- Rapid prototyping in polypropylene to provide fully functional samples before mold production
- Design for manufacture
- Mold flow analysis
- In-house prototype tooling and testing
- Risk management/FMEA

We develop integrative partnerships with our customers, providing high-quality products and tailored support services from concept through manufacturing scale-up. Whether you are a large corporation or a start-up company, we offer you quality plastics components, quickly and reliably, at any volume. Understanding your requirements is the foundation of our business.

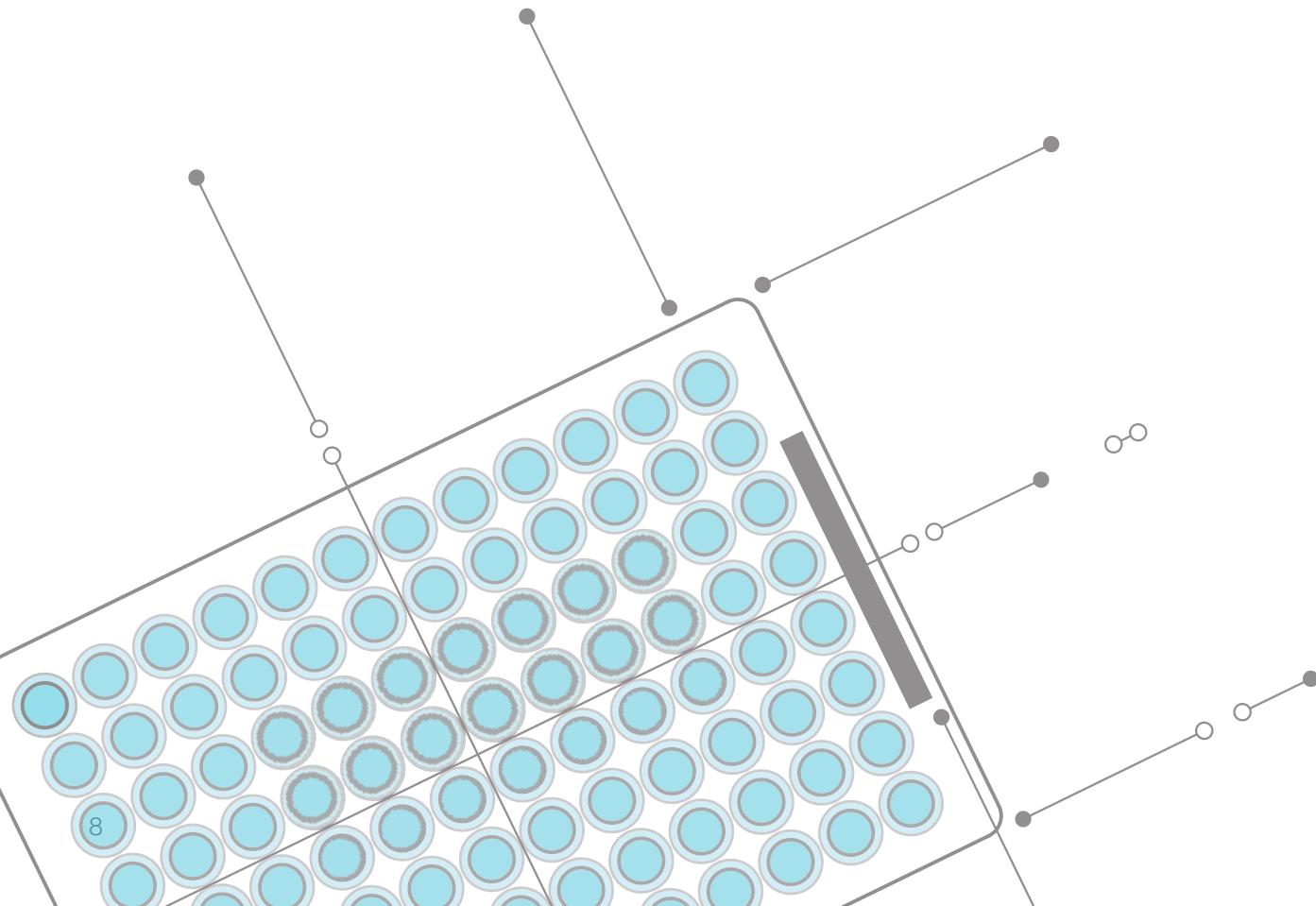


# Custom manufacturing

Injection molding is the technique used for the reproducible production of identical, high-precision components. Our engineers are continually improving the technology we use to develop and manufacture products. Molds are made using the latest machine-cutting technology, before being hand-finished by our highly skilled craftsmen. Every new manufacturing project requires the development and creation of a new tool—and we've made hundreds.

## We offer:

- Development of custom-made molds and automation, using a design team and tool team that work at the same site
- Trusted quality as pioneers in the manufacturing of thin-walled plastic consumables for PCR-based technologies
- A dedicated project management team to oversee development and maintain customer/client relationships



# Custom barcoding services

Tracking of samples is important to many customers, so we offer the ability to have your plates produced with barcode sequences unique to your product, in any common barcode format.

## Design the perfect barcoding\* solution to fit your unique needs

Choose plates for the ultimate barcoding flexibility

### Plate type

Any fully skirted or semi-skirted plate from the entire PCR range

### Barcode format

Code 128, Code 39, or Interleaved 2 of 5, with flexible human-readable code position

### Label size

Available in standard label sizes or customizable according to requirements

### Barcode density

Range of dimensions available

### Sequence

You determine start-to-end sequence and alpha-numeric pattern

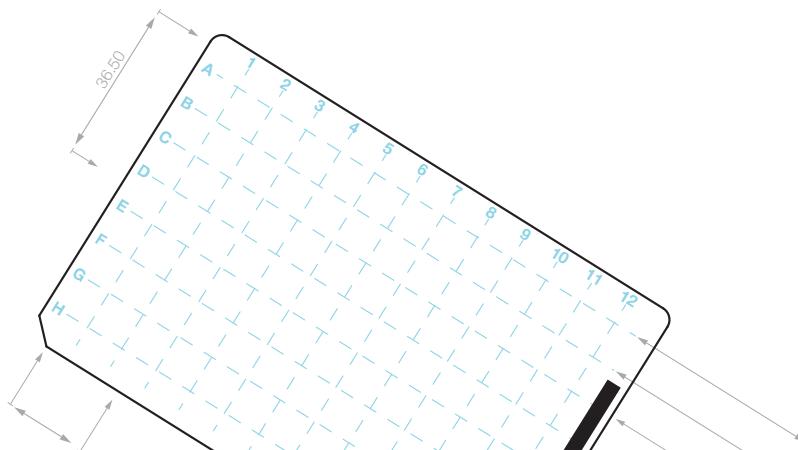
### Positioning

Any code on any side, all the same code, or varied

\* 1,000 plate minimum orders. Smaller quantities may be possible, but are subject to an order fee. Please inquire.

## Barcode format options

Multiplier		Barcode type		
		Code 128	Code 39	Interleaved 2 of 5
	7 mils	A0000002	A0000002	0000001
	10 mils	A0000002	A0002	0000001
Multplier	13 mils	A0000002	A002	0000001



# PCR tubes and strips

SP-0019, SP-0018



## Individual tubes

- Compatible with standard 0.2 or 0.5 mL thermal cycler blocks
- Caps form a secure seal, yet are easy to open and close
- Height: 20.7 mm, 0.2 mL tube
- Height: 29.75 mm, 0.5 mL tube

## Ordering information

### 0.2 mL individual tubes

SP-0018	w/Flat Caps	Clear
SP-0019	w/Domed Caps	Clear

Pack size: 1,000 tubes

### 0.5 mL individual tubes

SP-0021	w/Flat Caps	Clear
	Pack size: 1,000 tubes	

From top to bottom: SP-1182, SP-0020



## 0.2 mL strip tubes

- Compatible with 0.2 mL thermal cycler blocks
- Caps form a secure seal, yet are easy to apply and remove
- 8 tubes per strip
- Height: 20.7 mm
- Pitch: 9 mm

## Ordering information

### 0.2 mL strip tubes

SP-1182	w/Flat Caps	Clear
SP-0020	w/Domed Caps	Clear

Pack size: 250 tube strips/cap strips

SP-0085



## Low-profile strip tubes

- Ideal strip for reaction volumes below 20  $\mu$ L
- Compatible with 0.2 mL thermal cycler blocks
- Low profile to help reduce dead space and increase PCR efficiency
- Labeled A–H end tabs
- Height: 15.5 mm
- Pitch: 9 mm

## Ordering information

### Low-profile strip tubes

SP-0085	Strips of 8 Low-Profile Tubes	Clear
	Pack size: 120 tube strips	

SP-0036, SP-0035



#### 24- and 48-Well Semi-Skirted

- Conveniently pre-cut into 24- or 48-well segments
- Semi skirt adds rigidity and allows for labeling or barcoding
- Height: 18.65 mm
- Pitch: 9 mm

#### Ordering information

##### 24-Well Semi-Skirted (Pre-Cut)

SP-0036	Clear
Pack size: 50 plates	

##### 48-Well Semi-Skirted (Pre-Cut)

SP-0035	Clear
Pack size: 50 plates	

SP-3800, SP-3800W



#### 96-Well PCR Strip Tube Plate

- Strip of eight tubes linked to each other forming the familiar 12 x 8 or 96-well ANSI format
- Tear points between strips enable single or multiple strip requirements for customized experiments
- Maximum fill volume of 0.2 mL

Available as kit component only.

#### Ordering information

##### 96-Well PCR Strip Tube Plate, Low Profile

SP-3800	Clear
SP-3800/W	White
Pack size: 25 plates	

##### 96-Well PCR Strip Tube Plate, Frame, Skirted

SP-3805	White
Pack size: 25 frames	

SP-0127



H1

#### 96-Well Semi-Skirted, Segmented

- Proprietary segmented plate design allows plates to be cut into 24- and 48-well sections
- Semi skirt adds rigidity and allows for labeling or barcoding
- Cut corner: H1
- Height: 18.65 mm
- Pitch: 9 mm

#### Ordering information

##### 96-Well Semi-Skirted, Segmented

SP-0127	Clear
Pack Size: 25 plates	

SP-4896



#### 96-Well Non-Skirted, Flexi-Plate

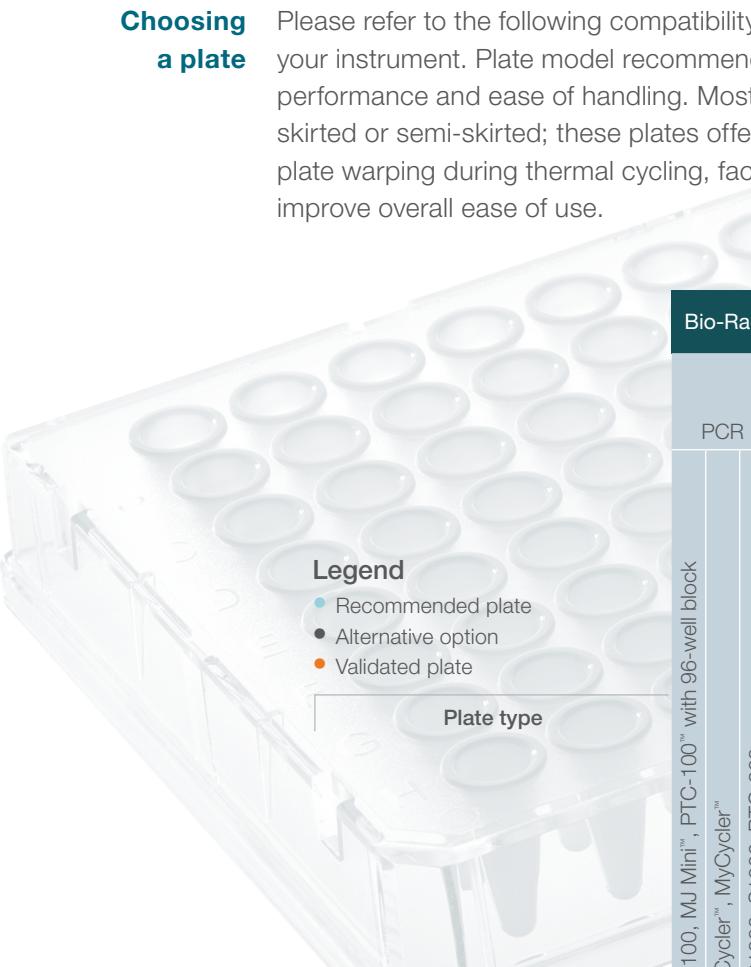
- Segmented into 12 breakable strips
- Standard profile
- Height: 19.3 mm
- Pitch: 9 mm

#### Ordering information

##### 96-Well Non-Skirted, Flexi-Plate

SP-4896	Clear
Pack size: 25 plates	

**Choosing a plate** Please refer to the following compatibility table to find the PCR plate suitable for your instrument. Plate model recommendations are based on the optimal PCR performance and ease of handling. Most recommended plates are either fully skirted or semi-skirted; these plates offer increased rigidity, which helps reduce plate warping during thermal cycling, facilitates multichannel pipetting, and helps improve overall ease of use.



**Legend**

- Recommended plate
- Alternative option
- Validated plate

**Plate type**

		Bio-Rad (MJ Research)		Agilent (Stratagene)		Eppendorf		Biometra	
		PCR	qPCR	PCR	qPCR	PCR	qPCR	PCR	qPCR
T100, MJ Mini™, PTC-100™ with 96-well block									
iCycler™, MyCycler™									
C1000, SmartCycler™									
iCycler™, iQ™ 4, iQ™ 5, MyIQ™, MyIQ2									
CFX96™, Opticon™									
CFX384™									
MiniOpticon™									
SureCycler™ 8800									
Robocycler									
Gradient Cycler									
Mx4000™									
Mx3000P™, Mx3005P™									
Mastercycler™ Gradient, Mastercycler™ EP Gradient/Pro									
M384									
Mastercycler™ ep Realplex									
Uno, TRRobot									
Uno II									
T1 Thermocycler									
TGradient									
TProfessional									
TOptical									
<b>96-well</b>		<b>Cat. No.</b>							
Fully skirted	Low-profile	SP-0037, SP-3805*		●	●	●		●	●
Semi-skirted	Fast block	W4346906, W4346907							
		SP-1900							
	Flat deck	SP-0824	●	●	●	●			
	Raised skirt	W8010560							
		SP-0446							
Non-skirted	Segmented	SP-0127	●	●	●	●	●	●	●
	Standard	SP-0074	●	●	●	●	●	●	●
		SP-4896	●	●	●	●	●	●	●
	Low-profile	SP-0029, SP-3800	●		●	●	●	●	●
<b>24- or 48-well</b>									
Semi-skirted	Standard	SP-0036, SP-0035		●	●	●	●	●	●
<b>384-well</b>									
Standard	Standard	W4309849							
		SP-1384		●		●		●	●

\* SP-3800 or SP-3800/W also required.

# Tip

Low-profile versions help minimize the air space above the PCR reaction, further reducing evaporation effects. We recommend that you choose the low-profile options where available.

## **Additional instruments**

# PCR plates

SP-0037



H1

## 96-Well Fully Skirted, Low Profile

- ANSI footprint and stackable for use in automated systems
- Low profile to help reduce dead space and increase PCR efficiency
- Available in a rigid version providing 4x more rigidity for superior robotic handling
- Cut corner: H1
- Height: 14 mm
- Pitch: 9 mm

### Ordering information

#### 96-Well Fully Skirted, Low Profile

SP-0037 Clear

Pack size: 25 plates

SP-1900



A1

## 96-Well Semi-Skirted, Fast Block

- Raised plate deck to aid in spill prevention
- Compatible with Fast blocks including Applied Biosystems™ instruments—no adapters necessary
- Cut corner: A1
- Height: 14.4 mm
- Pitch: 9 mm

### Ordering information

#### 96-Well Semi-Skirted, Fast Block

SP-1900 Clear

Pack size: 25 plates

SP-0824



A12

## 96-Well Semi-Skirted, Flat Deck

- Flat plate deck facilitates sealing and handling
- Compatible with Applied Biosystems instruments—no adapters necessary
- Cut corner: A12
- Height: 19.3 mm
- Pitch: 9 mm

### Ordering information

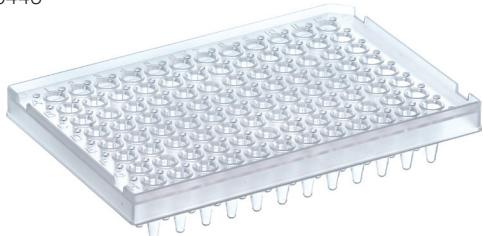
#### 96-Well Semi-Skirted, Flat Deck

SP-0824 Clear

SP-0824-L Clear w/black letters

Pack size: 25 plates

SP-0446



A12

### 96-Well Semi-Skirted, Raised Deck

- Available in a rigid version providing 4x more rigidity for superior robotic handling
- Compatible with Applied Biosystems instruments—no adapters necessary
- Cut corner: A12
- Height: 19.3 mm
- Pitch: 9 mm

#### Ordering information

96-Well Semi-Skirted, Raised Deck

SP-0446 Clear

Pack size: 25 plates

SP-0029



H12

### 96-Well Non-Skirted, Low Profile

- Low profile to help reduce dead space and increase PCR efficiency
- Available with black alphanumeric lettering
- Improved access for liquid handling
- Maximum well volume: 0.2 mL
- Cut corner: H12
- Height: 13.98 mm
- Pitch: 9 mm

#### Ordering information

96-Well Non-Skirted, Low Profile

SP-0029 Clear

Pack size: 25 plates

SP-0074



H1

### 96-Well Non-Skirted, Standard

- Non-skirted format compatible with most thermal cyclers
- Available with black alphanumeric lettering
- Cut corner: H1
- Height: 19.3 mm
- Pitch: 9 mm

#### Ordering information

96-Well Non-Skirted, Standard

SP-0074 Clear

SP-0074-L Clear w/black letters

Pack size: 25 plates

SP-1384



A24

### 384-Well Plates, Fully Skirted, Standard

- Compatible with all leading 384-block thermal cyclers
- Maximum well volume: 40 µL
- Cut corner: A24
- Height: 8 mm
- Pitch: 4.5 mm

#### Ordering information

384-Well Fully Skirted, Standard

SP-1384 Clear

Pack size: 50 plates

# Sealing options

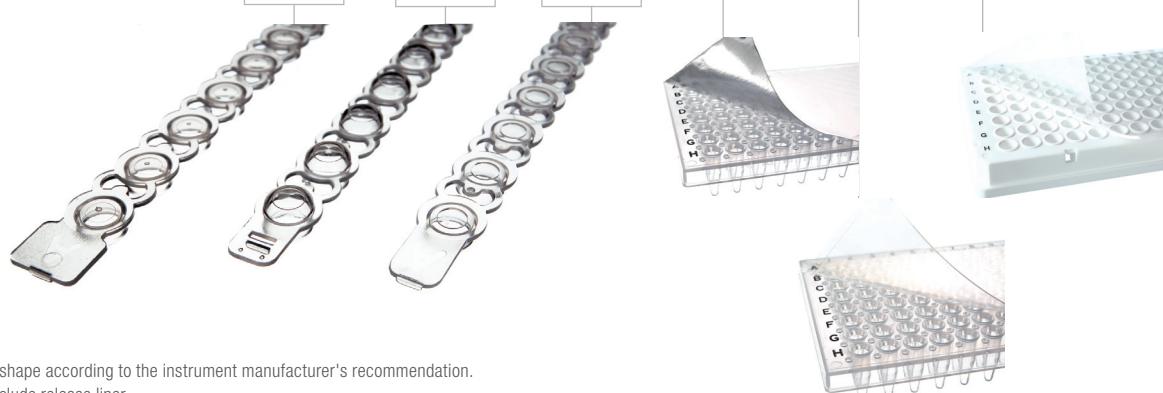
We offer a wide range of robust sealing options to suit any application. All of our sealing products are designed for ease of use while providing the ultimate in sample protection.

The qPCR sealing options are optically clear to help deliver maximum and consistent signal transmission, which is critical for accurate qPCR results.

## Legend

- Successfully tested
- ✗ Not recommended

PCR cap strips*					Adhesive seals			
	Flat cap strips	Domed cap strips	Optical qPCR cap strips	Flat cap mats	Ultra Clear cap mats	PCR foil seal	PCR film seal	Optical qPCR seal
Cat. No.	SP-0361 (8 caps per strip)	SP-0075 (8 caps per strip)	SP-0100 (8 caps per strip)	SP-3815 (12 x 8 strips)	SP-3820 (12 x 8 strips)	SP-0028	SP-0027	SP-0605
Pack size	250 strips	250 strips	120 strips	25 mats	25 mats	100 sheets	100 sheets	50 sheets
Applications	PCR (including waterbath)	●	●	●	●	●	●	●
	qPCR	✗	✗	●	✗	✗	✗	●
	Sealing temp range	-20°C–+120°C	-20°C–+120°C	-20°C–+120°C	-20°C–+120°C	-20°C–+120°C	-40°C–+120°C	-20°C–+120°C
	Long-term storage	●	●	●	●	●	●	✗
Mechanical properties	Pierceable	✗	✗	✗	✗	8.1 N	✗	✗
	Peelable	●	●	●	●	●	●	●
	Resealable	●	●	●	●	●	●	●
	Thickness**					75 µm	255 µm	100 µm
Resistance	DMSO (100%)	●	●	●	●	●	✗	●
	Ethanol (100%)	●	●	●	●	✗	✗	●
	Isopropanol (100%)	●	●	●	●	✗	✗	●
	Autoclavable	●	●	●	●	●		
	UV irradiation	●	●	●	●	●		
	Gamma irradiation	●	●	●	●	●		
Compatible products	Applicator tools	SP-0078	SP-0078	SP-0078		SP-1391	SP-1391	SP-1391
	Tubes/plates	8-strip PCR tubes 96-well PCR plates	All plates	All plates	All plates			



\* Choose cap shape according to the instrument manufacturer's recommendation.

\*\* Does not include release liner.

# Plastics for Applied Biosystems instruments

Applied Biosystems™ PCR plastics are optimized to provide unmatched temperature accuracy and uniformity for fast and efficient PCR and real-time PCR applications. Only these plastics are validated and “Engineer-Approved” for use with Applied Biosystems instruments, for optimal fit and performance.

## Features of Applied Biosystems plastics:

- All plastics are produced in injection-molding, state-of-the-art facilities that meet 10,000 clean room standards
- ISO 9001– and ISO 13485–certified facilities
- Six Sigma and lean manufacturing processes to help enable the highest quality and lower costs

- Custom or no-label packaging
- Production runs 24/7 with complete traceability and process controls
- Customized QC, quantities, and configurations

## Tube Strips

W4316567



### 8-tube strips, 0.2 mL

- Designed for precise PCR and qPCR applications and optimal fit on Applied Biosystems instruments
- Polished surface and conical bottom enable maximum sample recovery
- 8 tubes per strip
- Height: 20.84 mm
- Pitch: 9 mm

#### Ordering information

##### 0.2 mL tube strips

W4316567      Optical  
Pack size: 125 tube strips

## Plates

W4309849



### 384-well plate with barcode

- Maximum well volume: 40 µL
- Cut corner: A24
- Height: 9.71 mm
- Pitch: 4.5 mm

#### Ordering information

##### 384-well plate with barcode

W4309849      Optical  
Pack size: 50 plates

## Plates cont.

W8010560



### 96-well plate with no barcode

- Validated to work with Applied Biosystems 96-well real-time PCR systems and thermal cyclers for consistent, reliable results
- Optimized for well-to-well temperature uniformity
- Maximum well volume: 0.2 mL
- Cut corner: A12
- Height: 20.84 mm
- Pitch: 9mm

#### Ordering information

##### 96-well plate with no barcode

W8010560 Optical

Pack size: 10 plates

W4346907

W4346906



### Fast 96-well plate

- Validated to work with Applied Biosystems Fast 96-well instruments
- Optimized for well-to-well temperature uniformity
- Maximum well volume: 0.1 mL
- Cut corner: A12
- Height: 15.94 mm
- Pitch: 9 mm

#### Ordering information

##### Fast 96-well plate

W4346907 Optical

Pack size: 10 plates

##### Fast 96-well plate with barcode

W4346906 Optical

Pack size: 20 plates

## Sealing options

W8010535

W4323032



### 8-cap strips

- Designed to fit on Applied Biosystems™ MicroAmp™ reaction tube strips and 96-well plates; the domed profile is suitable for endpoint PCR, and the optical profile cap strips can be used for both endpoint and real-time PCR applications
- Provide a tight seal to minimize evaporation

#### Ordering information

##### 8-cap strips

W8010535 Domed caps Clear

W4323032 Optical caps Clear

Pack size: 300 strips

W4306311

W4311971



### Adhesive film

- Designed to fit on MicroAmp 96-well and 384-well plates
- Reduces the chance of well-to-well contamination and sample evaporation, and helps enable reliable PCR and real-time PCR results
- Available as Clear (standard use) or Optical (for real-time PCR analysis)

#### Ordering information

##### Adhesive film

W4306311 PCR

W4311971 Real-time PCR

Pack size: 100 seals

# Customer service

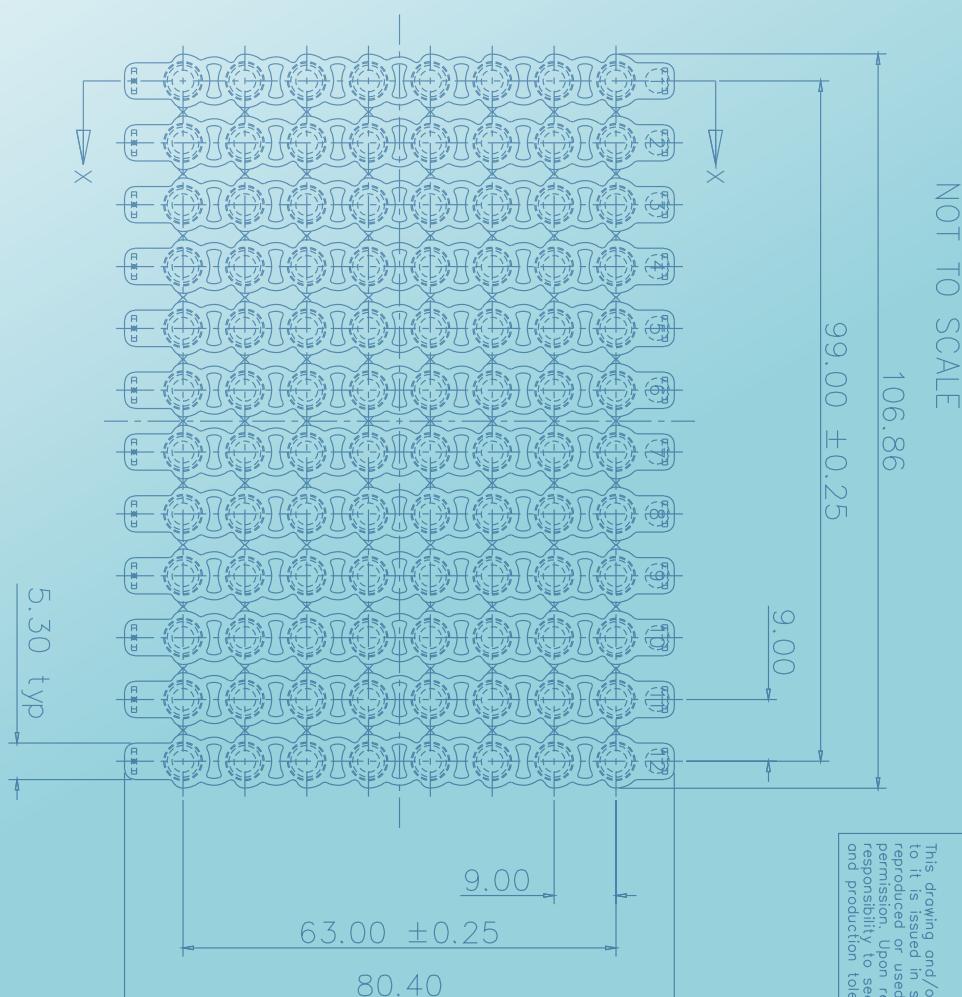
Because maintaining long-term relationships with customers is our goal, we focus on delivering the standard of service that only highly experienced staff members can provide. Committed to communication, we're responsive and we deliver on our promises.

- Your business will be assigned a team with the experience and organizational contacts to accomplish your requirements
- We provide prompt, accurate responses to questions, documentation requests, and technical support
- We take your confidentiality very seriously

Ultra Clear cap mats

TITLE

DRG. NO.	SP-3820	ISSUE	ORIGINAL	DATE	4/2/16
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Find out more at [thermofisher.com/oemplastics](http://thermofisher.com/oemplastics)



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