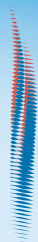


# Corning Life Sciences Selection Guide



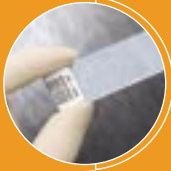
**CORNING**  
Discovering Beyond Imagination

Life  
Sciences

Cell Culture



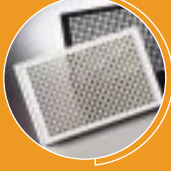
Large Scale Culture



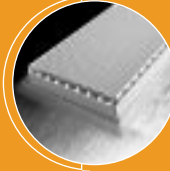
Drug Discovery



Genomics



General Labware





## Introduction

Corning Life Sciences is pleased to present our Life Sciences Selection Guide. In this guide, you will find a selection of Corning's newest and most requested products.

For up-to-date information on Corning Life Sciences' comprehensive range of products and services, go to [www.corning.com/lifesciences](http://www.corning.com/lifesciences) where you can access:

- ▶ New Products Information
- ▶ Technical Information including:
  - Application Notes
  - Instruction Manuals
  - Product Bulletins
- ▶ Educational Opportunities
- ▶ Product Catalog Information
- ▶ Product Literature
- ▶ Complete Distributor Information

For additional product information, please visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences), or contact our customer services team listed on the back cover.

## Ordering Information

Corning products are available as follows:

- ▶ Directly from Corning's European Distribution Centre. To place your order, simply contact us as follows:

### France

t 0800 916 882

f 0800 918 636

ServiceClients@  
corning.com

### United Kingdom

t 0800 376 8660

f 0800 279 1117

UKCustomerService@  
corning.com

### Germany

t 0800 101 1153

f 0800 101 2427

Kundenbetreuung@  
corning.com

### The Netherlands and All Other Countries

t +31 20 659 6051

f +31 20 659 7673

cceurnl@corning.com

- ▶ Through any Corning Distributor – please visit our website for a full listing. To place an order, simply contact the Distributor of your choice. For each requested product, provide the Corning catalogue number, product description, and desired quantity.

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# Cell Culture

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## Overview

### DESIGNED FOR PERFORMANCE

Corning Life Sciences offers a full line of cell culture products that are manufactured under strict process controls guaranteeing consistent product performance. All Corning Life Sciences plastics manufacturing facilities are ISO 9002 registered. ISO registration is recognized worldwide as a standard of excellence for quality systems.

In addition, customers can now request a Certificate of Quality for any Corning® or Costar® cell culture product. This certificate details lot-specific information on component materials, sterility testing, pyrogen testing, cell attachment, and growth characteristics.

Also available are detailed product descriptions and drawings that highlight product dimensions and testing procedures. All are available simply by calling your local Corning Life Sciences office.



### ADDITIONAL QUALITY ASSURANCES

#### Nonpyrogenic Certification

Most Corning and Costar cell culture products are certified nonpyrogenic with a documented endotoxin level of equal to or less than 0.1 EU/mL. Endotoxins have been shown to cause variability in cell culture. Nonpyrogenic certification is just another way Corning helps ensure consistent cell culture results. Corning also offers a detailed technical bulletin on the effects of endotoxins in cell culture. This may be obtained by calling your local Corning Life Sciences office or by downloading the bulletin from the Corning web site [www.corning.com/lifesciences](http://www.corning.com/lifesciences).



#### Lot Number Traceability

To ensure accurate lot number traceability in biotechnology research and production facilities, all Corning and Costar cell culture flasks and most roller bottles feature a lot number individually printed on each product. Lot number traceability helps simplify quality assurance procedures for tracking and monitoring production and research processes.



#### Consistent Surface Chemistry

All Corning and Costar cell culture products are produced in FDA-registered facilities. Cell culture products are made from USP Class VI materials in accordance with documented manufacturing procedures. By carefully controlling both the materials we use and our manufacturing process, Corning is able to provide consistent surface chemistries across our entire line of cell culture products. This consistency increases the researcher's ability to produce reliable results.

## Cell Culture Flasks

Corning® and Costar® flasks are available in a variety of sizes, designs and cap styles to meet your needs.

- ▶ Manufactured from optically clear virgin polystyrene
- ▶ Treated for optimal cell attachment
- ▶ Printed with lot numbers for ease in traceability
- ▶ 100% integrity tested
- ▶ Sterilized by gamma irradiation
- ▶ Certified nonpyrogenic

### Flask Cap Styles



**Plug seal caps** feature one-piece linerless construction and are designed for use in closed systems, providing a liquid- and gas-tight seal. When loosened, this cap can also be used in open systems. This cap design was a Corning innovation that first appeared in 1974.



**Phenolic style caps** are designed (when loosened) for use in open systems requiring gas exchange. With the caps slightly loosened, gas is exchanged between the environments inside and outside of the flask.



**Vent caps** contain a 0.2 µm nonwetable membrane sealed to the cap, providing consistent, sterile gas exchange while minimizing the risk of contamination. These caps are highly recommended for use in all CO<sub>2</sub> incubators, especially for long-term use. The vent cap was a Corning innovation that first appeared in 1988.

### Flask Neck Styles



Straight neck flasks are ideal for larger medium volumes since this design reduces medium sloshing into the cap.



Canted neck flasks allow easier pouring and improved access to the flask for pipetting or scraping. The canted neck design was a Corning innovation that first appeared in 1974.

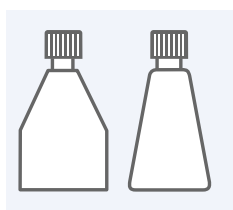


Angled neck improves pipette access and reduces medium sloshing into the neck. This patented design was a Corning innovation that first appeared in 1988.

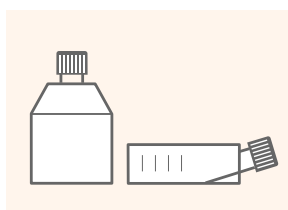


### Flask Shapes

Choosing a flask shape is usually a matter of personal preference:



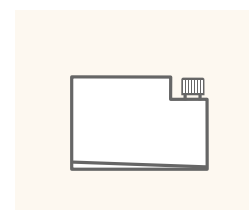
**Triangular and modified triangular flasks** offer good pipette and cell scraper access to the corners. The wider base provides added stability.



**Rectangular flasks** have a ramp from the bottom to the canted neck for easier pouring and pipette access. Most canted neck flasks also have an antitip skirt to enhance stability.



**Angled neck and traditional straight neck flasks** utilize the entire bottom area for cell growth. Their design saves on space and reduces medium sloshing into the neck.



**RoboFlask™ vessels** are robotics-compatible cell culture flasks offering 92.6 cm<sup>2</sup> cell growth surface area. The flasks are designed for use in automated cell culture systems utilizing a microplate-size format.



**3056** 25 cm<sup>2</sup> Triangular Flask with Vent Cap

### Corning® Cell Culture Flask Ordering Information

#### 25 cm<sup>2</sup> Growth Area Flasks

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
430168	TC	Rectangular	Canted	Plug Seal	20	500
430372	TC	Rectangular	Canted	Phenolic-Style	20	500
430639	TC	Rectangular	Canted	Vent Cap	20	200
3055	TC	Triangular	Angled	Phenolic-Style	20	500
3056	TC	Triangular	Angled	Vent Cap	10	200
3289	Corning® CellBIND® Surface	Rectangular	Canted	Vent Cap	20	200

#### 75 cm<sup>2</sup> Growth Area Flasks

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
430641	TC	Rectangular	Canted	Vent Cap	5	100
430720	TC	Rectangular	Canted	Plug Seal	5	100
430725	TC	Rectangular	Canted	Phenolic-Style	5	100
3275	TC	Modified triangular	Straight	Phenolic-Style	5	100
3276	TC	Modified triangular	Straight	Vent Cap	5	100
3375	TC	Rectangular	Canted	Phenolic-Style	5	100
3376	TC	Rectangular	Canted	Vent Cap	5	100
3290	Corning CellBIND Surface	Rectangular	Canted	Vent Cap	5	100



**430639** 25 cm<sup>2</sup> Canted Neck Flask with Vent Cap



**430641** 75 cm<sup>2</sup> Canted Neck Flask with Vent Cap



**3376** 75 cm<sup>2</sup> Canted Neck Flask with Vent Cap



**3275** 75 cm<sup>2</sup> Triangular Flask with Phenolic-Style Cap





**3070** RoboFlask™ Cell Culture Vessel with Septum Cap



**431306** 175 cm² Bar Coded Flask with Vent Cap



**430823** 150 cm² Canted Neck Flask with Plug Seal Cap

**92.6 cm² Growth Area RoboFlask™ Vessels**

Cat. No.	Description	Qty/Pk	Qty/Cs
3070	RoboFlask Cell Culture Vessel for automation, tissue culture treated, with bar code, septum cap, sterile	20	100
3071	RoboFlask Cell Culture Vessel for manual use, tissue culture treated, with bar code, flat cap (without septum), sterile	20	100
3069	RoboFlask Cell Culture Vessel for automation, tissue culture treated, with bar code, septum cap, sterile	10	50
3059	RoboFlask Cell Culture Vessel for manual use, tissue culture treated, with bar code, flat cap (without septum), sterile	10	50
3067	RoboFlask Cell Culture Vessel for automation, Corning® CellBIND® surface treatment with bar code, septum cap, sterile	20	100
3068	RoboFlask Cell Culture Vessel for automation, Corning CellBIND surface treatment with bar code, septum cap, sterile	10	50

**Cell Culture Flask Application Tip**

Corning recommends 0.2 to 0.3 mL of medium per cm<sup>2</sup> of growth area.

**Cell Culture Flask Selection Tip**

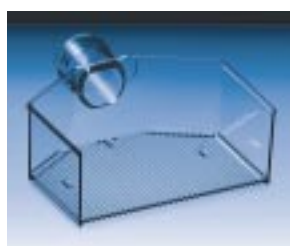
The 235 cm<sup>2</sup> Expanded Surface flask has the same footprint as the 175 cm<sup>2</sup> flasks.

**150 cm² Growth Area Flasks**

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
430823	TC	Rectangular	Canted	Plug Seal	5	50
430824	TC	Rectangular	Canted	Phenolic-Style	5	50
430825	TC	Rectangular	Canted	Vent Cap	5	50
3291	Corning CellBIND Surface	Rectangular	Canted	Vent Cap	5	50

**175 cm² Growth Area Flasks**

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
431079	TC	Rectangular	Angled	Plug Seal	5	50
431080	TC	Rectangular	Angled	Vent Cap	5	50
431085	TC	Rectangular	Angled	Phenolic-Style	5	50
431306*	TC	Rectangular	Angled	Vent Cap	7	84
431328*	Corning CellBIND Surface	Rectangular	Angled	Vent Cap	7	84
3292	Corning CellBIND Surface	Rectangular	Angled	Vent Cap	5	50
3298	Corning CellBIND Surface	Rectangular	Angled	Phenolic-Style	5	50



**431346** 235 cm<sup>2</sup> Expanded Growth Area Flask with Bar Code

\*Flask prelabeled with bar code, validated for use with SelecT™ Robotic System.



431082 225 cm² Angled Neck Flask with Vent Cap



3001 225 cm² Canted Neck Flask with Vent Cap

225 cm² Growth Area Flasks

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
431081	TC	Traditional	Canted	Plug Seal	5	25
431082	TC	Traditional	Canted	Vent Cap	5	25
3000	TC	Rectangular	Canted	Phenolic-Style	4	24
3001	TC	Rectangular	Canted	Vent Cap	4	24
3293	Corning CellBIND Surface	Traditional	Angled	Vent Cap	5	25

235 cm² Expanded Growth Area Flask

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
431346*	Corning® CellBIND® Surface	Rectangular	Angled	Vent Cap	7	42

\*Flask prelabeled with bar code, validated for use with SelecT™ Robotic System.

Cell Yields and Recommended Medium Volume

Corning® and Costar® Flasks	Approximate Growth Area (cm²)	Average Cell Yield*	Recommended Medium Volume (mL)	Maximum Working Volume (mL)†
25 cm²	25	2.5 x 10 <sup>6</sup>	5 - 7.5	10
75 cm² Canted neck	75	7.5 x 10 <sup>6</sup>	15 - 22.5	60
75 cm² Straight neck	75	7.5 x 10 <sup>6</sup>	15 - 22.5	90
RoboFlask™ Vessel	93	9.4 x 10 <sup>6</sup>	20 - 30	70
150 cm²	150	1.5 x 10 <sup>7</sup>	30 - 45	210
162 cm²	162	1.6 x 10 <sup>7</sup>	32 - 48	175
175 cm²	175	1.75 x 10 <sup>7</sup>	35 - 52.5	250
225 cm²	225	2.25 x 10 <sup>7</sup>	45 - 67.5	370
235 cm²	235	2.35 x 10 <sup>7</sup>	47 - 70.5	250

\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm² from a 100% confluent culture. Yields from many cell types can be lower than this.  
 † Maximum working volume is the amount a flask can hold in the horizontal position when filled to the neck.

## Cell Culture Dishes

### Ultra Low Attachment Dishes

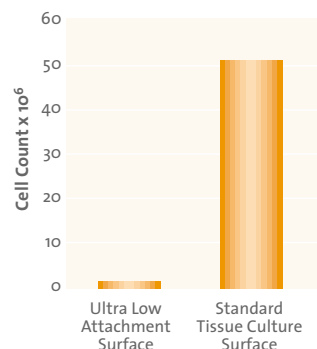
The Ultra Low Attachment surface is a unique covalently bonded hydrogel surface that is hydrophilic and neutrally charged. It minimizes cell attachment, protein absorption and enzyme activation. The surface is noncytotoxic, biologically inert and nondegradable.



3261 and 3262 Ultra Low Attachment Dishes

Cat. No.	Dish Style (mm)*	Height (mm)	Growth Area (cm²)	Qty/Pk	Qty/Cs
3261	60	15	21	5	20
3262	100	20	55	5	20

\*60 mm dish = 51.4 mm; 100 mm dish = 80.5 mm



#### Comparison of Cell Attachment in Ultra Low vs. Standard Tissue Culture Treated Plates

Vero cells plated at 2.6 x 10<sup>6</sup> cells per well grown for 4 days at 37°C in a 5% CO<sub>2</sub> environment show a 99% reduction in cellular attachment vs. standard culture treated product.

### Corning® Cell Culture Treated Dishes

- ▶ Manufactured from optically-clear virgin polystyrene
- ▶ Treated for optimal cell attachment
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ Have stacking beads to aid in handling
- ▶ Supplied with vents to provide consistent gas exchange



**3296** Corning® CellBIND® Surface 100 mm Dishes



**430196** Gridded 60 mm Dish



**430167** 100 mm Dish

### Corning Cell Culture Dish Ordering Information

Cat. No.	Surface	Dish Style <sup>a</sup> (mm)	Approx. Height (mm)	Growth Area (cm <sup>2</sup> )	Qty/Pk	Qty/Cs
3294	Corning® CellBIND® Surface	35	10	8	10	210
430165	TC	35	10	8	20	500
430166	TC	60	15	21	20	500
3295	Corning CellBIND Surface	60	15	21	7	126
3261	Ultra Low Attachment	60 <sup>b</sup>	20	21	5	20
3262	Ultra Low Attachment	100 <sup>b</sup>	20	55	5	20
430196	TC	60 with 2 mm grid	15	21	20	500
3296	Corning CellBIND Surface	100	20	55	5	40
430167	TC	100	20	55	20	500
430293 <sup>c</sup>	TC	100	20	55	10	480
430599	TC	150	25	151	5	60
431110 <sup>d</sup>	TC	245	25	500	4	16
431112 <sup>e</sup>	TC	245	25	500	4	16

<sup>a</sup>Dish style (mm) = actual growth surface diameters: 35 mm dish = 33.9 mm; 60 mm dish = 51.4 mm; 100 mm dish = 80.5 mm; 150 mm dish = 138.7 mm.

<sup>b</sup>This covalently bonded hydrogel surface minimizes cell attachment, protein absorption, enzyme activation, and cellular activation. The surface is noncytotoxic, biologically inert, and nondegradable.

<sup>c</sup>Cat. No. 430293 consists of 6-pack carriers, each containing 6 packages of 10 dishes each.

<sup>d</sup>Cat. Nos. 431110 and 431112 are square dishes with interior bottom plate dimensions of 224 mm x 224 mm.

<sup>e</sup>Cat. No. 431112 is a square dish featuring a removable spillguard.



**431110** 500 cm<sup>2</sup> Cell Culture Dish



**431112** 500 cm<sup>2</sup> DW Spillguard Dish

**Cell Culture Dish Application Tips**

- ▶ The 150 and 245 mm culture dishes make excellent carriers and incubator trays for 35 and 60 mm dishes. This helps prevent spills and reduces opportunities for contamination.
- ▶ Corning recommends 0.2 to 0.3 mL of medium per cm<sup>2</sup> of growth area.

**Corning® Nontreated Cell Culture Dishes**

- ▶ Manufactured from optically clear virgin polystyrene
- ▶ Not cell culture treated for applications where cell attachment is not desired
- ▶ Have stacking beads to aid in handling
- ▶ Supplied with vents to provide consistent gas exchange
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

**Corning Nontreated Cell Culture Dish Ordering Information**

Cat. No.	Dish Style* (mm)	Height (mm)	Approx. Growth Area (cm <sup>2</sup> )	Qty/Pk	Qty/Cs
430588	35	10	8	20	500
430589	60	15	21	20	500
430591	100	20	55	20	500
430597	150	25	148	5	60
431111†	245	25	500	4	16

\*Note: Dish style (mm) = actual growth surface diameters: 35 mm dish = 33.9 mm; 60 mm dish = 51.4 mm; 100 mm dish = 80.5 mm; 150 mm dish = 134.5 mm.  
 †Cat. No. 431111 is a square dish with interior bottom plate dimensions of 224 mm x 224 mm.

**Expected Cell Yields and Recommended Medium Volumes**

Corning Dishes	Approximate Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Recommended Medium Volume (mL)†
35 mm	8	8.0 x 10 <sup>5</sup>	1.6 - 2.4
60 mm	21	2.1 x 10 <sup>6</sup>	4.2 - 6.3
100 mm	55	5.5 x 10 <sup>6</sup>	11 - 16.5
150 mm	148	1.48 x 10 <sup>7</sup>	30 - 45
245 mm (square)	500	5.0 x 10 <sup>7</sup>	100 - 150

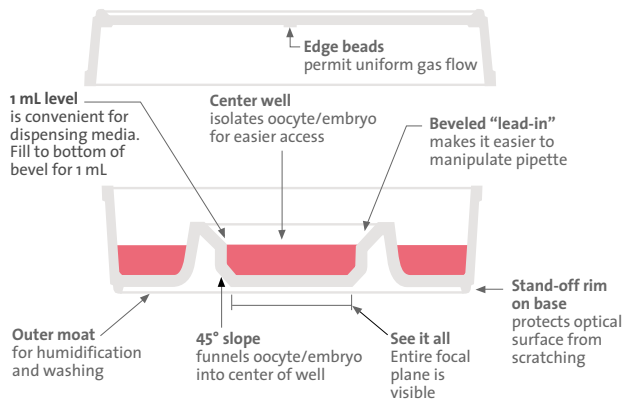
\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture.  
 †Yields from many cell types can be lower than this.

**Costar® IVF Culture Dish**

- ▶ 20 mm center well
- ▶ Inner well holds 3 mL of medium while the outer well holds 10 mL
- ▶ Treated for optimal cell attachment
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ For research use only



3260 IVF Culture Dish



**Costar IVF Culture Dish Ordering Information**

Cat. No.	Size (mm)	Description (mm)	Center Well (mm)	Qty/Pk	Qty/Cs
3260	60	60 x 15	20	20	500

## Multiple Well Plates



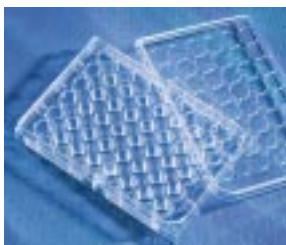
3516 6 Well Culture Plate



3513 12 Well Culture Plate



3524 24 Well Culture Plate



3548 48 Well Culture Plate

### Costar® 6, 12, 24, and 48 Well Cell Culture Plates

- ▶ Flat bottoms
- ▶ Nonreversible lids with condensation rings to reduce contamination
- ▶ Individual alphanumeric codes for well identification
- ▶ Uniform footprint for ease in stacking
- ▶ Treated for optimal cell attachment (except where noted)
- ▶ Sterilized by gamma irradiation
- ▶ Certified nonpyrogenic

### 6, 12, 24, and 48 Well Plates Ordering Information

Cat. No.	Surface	Plate Type	Qty/Pk	Qty/Cs
<b>6 Well Plates</b>				
3335	Corning® CellBIND® Surface	Standard clear plate	5	50
3506	TC	Standard clear plate	5	100
3516	TC	Standard clear plate	1	50
3471	Ultra Low Attachment	Standard clear plate with hydrogel*	1	24
<b>12 Well Plates</b>				
3336	Corning CellBIND Surface	Standard clear plate	5	50
3512	TC	Standard clear plate	5	100
3513	TC	Standard clear plate	1	50
<b>24 Well Plates</b>				
3337	Corning CellBIND Surface	Standard clear plate	5	50
3524	TC	Standard clear plate	1	100
3526	TC	Standard clear plate	1	50
3527	TC	Standard clear plate	5	100
3473	Ultra Low Attachment	Standard plate with hydrogel*	1	24
<b>48 Well Plates</b>				
3548	TC	Standard clear plate	1	100

\*This covalently bonded hydrogel surface minimizes cell attachment, protein absorption, enzyme activation and cellular activation. The surface is noncytotoxic, biologically inert and nondegradable.

### Well Dimensions, Expected Cell Yields, and Recommended Medium Volumes

Cell Culture Plates	Well Diameter (Bottom, mm)	Single Well Only				Entire Plate		
		Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Total Well Volume (mL)	Working Volume (mL)	Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Working Volume (mL)
6 well	34.8	9.5	9.5 x 10 <sup>5</sup>	16.8	1.9 - 2.9	57	5.7 x 10 <sup>6</sup>	11.4 - 17.1
12 well	22.1	3.8	3.8 x 10 <sup>5</sup>	6.9	0.760 - 1.14	45.6	4.56 x 10 <sup>6</sup>	9.1 - 13.7
24 well	15.6	1.9	1.9 x 10 <sup>5</sup>	3.4	0.380 - 0.570	45.6	4.56 x 10 <sup>6</sup>	9.1 - 13.7
48 well	11	0.95	8.0 x 10 <sup>4</sup>	1.6	0.19 - 0.285	45.6	38.4 x 10 <sup>6</sup>	9.1 - 13.7

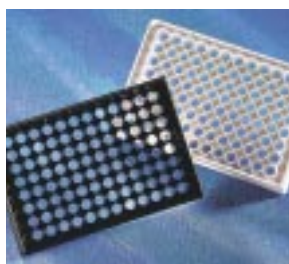
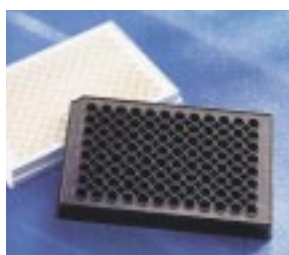
\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture. Yields from many cell types can be lower than this.



## Corning® and Costar® 96 Well Cell Culture Plates



3596 96 Well Culture Plate

3610 and 3603  
96 Well Clear Bottom Plates3917 and 3916  
96 Well Solid Plates

- ▶ Flat bottoms (except where noted)
- ▶ Nonreversible lids with condensation rings to reduce contamination (except where noted)
- ▶ Treated for optimal cell attachment (except where noted)
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ Individual alphanumeric codes for well identification

Black plates are designed to lower background in fluorescent assays and reduce crosstalk. White plates are designed for luminescent assays. Some plates have a poly-D-lysine coating to enhance cell attachment. Corning offers many other 96 well plate types for applications other than cell culture; for a complete listing, check the catalog at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

### 96 Well Plate Ordering Information

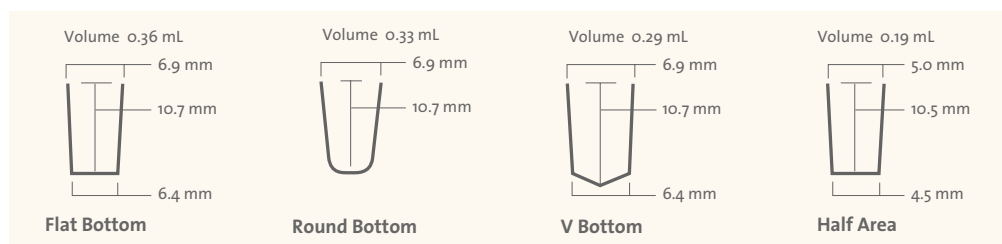
Cat. No.	Surface	Description	Qty/ Pk	Qty/ Cs
<i>Clear Plates</i>				
3300	Corning® CellBIND® Surface	Standard clear plate	5	50
3596	TC	Standard clear plate	1	50
3997	TC	Standard clear plate	10	50
3598	TC	Standard clear plate	5	100
3599	TC	Standard clear plate	1	100
3585	TC	Standard clear plate with special low evaporation lid	5	50
3595	TC	Standard clear plate with special low evaporation lid	1	50
3594	TC	Standard clear plate without lid	1	100
3697	TC	96 well half area clear plate	20	100
3790	TC	96 well round bottom, polypropylene plate with polystyrene lid	1	50
3799	TC	96 well round bottom clear plate	1	50
3894	TC	96 well V-bottom clear plate	1	50
3665	poly-D-lysine	Standard clear plate, coated	25	100
9102	TC	8-well strip plate, assembled 12 strips per plate	1	50
3474	Ultra Low Attachment	Standard clear plate with hydrogel*	1	24
<i>White Plates</i>				
3917	TC	Solid white plate	20	100
3362	TC	Solid white plate without lid	25	100
3688	TC	96 well half area solid white plate	20	100
3610	TC	White plate with clear bottom	1	48
3903	TC	White plate with clear bottom	20	100
3666	poly-D-lysine	White plate with clear bottom	25	100
<i>Black Plates</i>				
3340	Corning CellBIND Surface	Black plate with clear bottom with lid	5	50
3916	TC	Solid black plate	20	100
3603	TC	Black plate with clear bottom	1	48
3904	TC	Black plate with clear bottom	20	100
3667	poly-D-lysine	Black plate with clear bottom	25	100
3614	TC	Black plate with special optics, ultrathin, clear bottom, without lid	25	100
<i>Lids and Tape</i>				
3099	–	Universal lid	25	50
3345	–	Breathable Sealing tape, Sterile	50	500
3930	–	Rigid styrene lid with condensation rings	1	100
3931	–	Rigid styrene lid with condensation rings	25	50

\*This covalently bonded hydrogel surface minimizes cell attachment, protein absorption, enzyme activation and cellular activation. The surface is noncytotoxic, biologically inert and nondegradable.



## 96 Well Cell Culture Plates

### Well Geometry

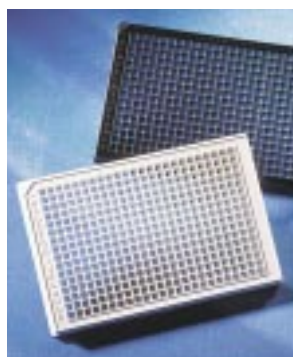


### Well Dimensions, Expected Cell Yields, and Recommended Medium Volume

Cell Culture Plates	Well Diameter (Bottom, mm)	Single Well Only				Entire Plate		
		Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Total Well Volume (mL)	Working Volume (mL)	Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Working Volume (mL)
96 well flat bottom	6.4	0.32	3.2 x 10 <sup>4</sup>	0.36	0.100 - 0.200	30.7	3.07 x 10 <sup>6</sup>	9.6 - 19.2
96 well round bottom	6.4	NA <sup>†</sup>	NA <sup>†</sup>	0.33	0.100 - 0.200	NA <sup>†</sup>	NA <sup>†</sup>	9.6 - 19.2
96 well V bottom	6.4	0.38	3.8 x 10 <sup>4</sup>	0.29	0.100 - 0.200	36.5	3.65 x 10 <sup>6</sup>	9.6 - 19.2
96 half area	4.5	0.16	1.6 x 10 <sup>4</sup>	0.19	0.050 - 0.100	15.4	1.54 x 10 <sup>6</sup>	4.8 - 9.6

\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture. Yields from many cell types can be lower than this.  
<sup>†</sup>Because these wells are round, the surface area available for cell attachment is dependent on the medium volume used.

## 384 Well Cell Culture Plates



3707 and 3712  
384 Well Clear Bottom Plates

- ▶ Flat bottoms
- ▶ Nonreversible lids
- ▶ Treated for optimal cell attachment
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

Black plates are designed to lower background in fluorescent assays and reduce crosstalk. White plates are designed for luminescent assays. Some plates have a poly-D-lysine coating to enhance cell attachment. Corning offers many other 384 well plate types for applications other than cell culture; for a complete listing, check the catalog at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

### 384 Well Cell Culture Plate Ordering Information

Cat. No.	Surface	Description	Qty/Pk	Qty/Cs
<b>Clear Plates</b>				
3701	TC	Standard clear plate	20	100
3662	poly-D-lysine	Standard clear plate	25	100
<b>White Plates</b>				
3704	TC	Solid white plate	20	100
3707	TC	White plate with clear bottom	20	100
3663	poly-D-lysine	White plate with clear bottom	25	100
<b>Black Plates</b>				
3709	TC	Solid black plate	20	100
3712	TC	Black plate with clear bottom	20	100
3664	poly-D-lysine	Black plate with clear bottom	25	100
3683	Corning® CellBIND® Surface	Black plate with clear bottom with lid	10	50

## Well Dimensions, Expected Cell Yields, and Recommended Medium Volumes

Cell Culture Plates	Well Diameter (Bottom, mm)	Single Well Only				Entire Plate		
		Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Total Well Volume (mL)	Working Volume (mL)	Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Working Volume (mL)
384 well	2.7 x 2.7†	0.056	5.6 x 10 <sup>3</sup>	0.125	.025 - .050	21.5	2.15 x 10 <sup>6</sup>	9.6 - 19.2

\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture. Yields from many cell types can be lower than this.

†These wells are square.

## 1536 Well Cell Culture Plates

- ▶ Flat bottoms with no lids (Top plate serves as lid for plate underneath.)
- ▶ Eight extra wells on left and right sides that can be used for running controls
- ▶ Treated for optimal cell attachment
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

Black plates are designed to lower background in fluorescent assays and reduce crosstalk. White plates are designed for luminescent assays. Corning offers other 1536 well plate types for applications other than cell culture; for a complete listing, check the catalog at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

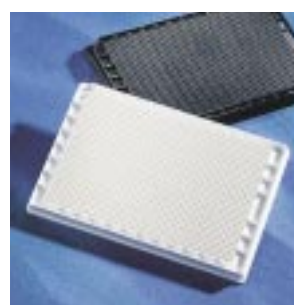
## 1536 Well Cell Culture Plate Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
3853	Standard clear plate	20	100
3855	Solid white plate	20	100
3854	Solid black plate	20	100

## Well dimensions, Expected Cell Yields, and Recommended Medium Volumes

Cell Culture Plates	Well Diameter (Bottom, mm)	Single Well Only				Entire Plate		
		Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Total Well Volume (µL)	Working Volume (µL)	Approx. Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Working Volume (mL)
1536 well	1.2	0.011	1.2 x 10 <sup>3</sup>	2.3	1.0 - 1.5	16.9	1.69 x 10 <sup>6</sup>	1.5 - 2.3

\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture. Yields from many cell types can be lower than this.



3955 and 3954  
1536 Well Culture Plates

## Transwell® Permeable Supports



Transwell cell culture inserts are convenient, easy-to-use permeable support devices for the study of both anchorage-dependent and anchorage-independent cell lines.

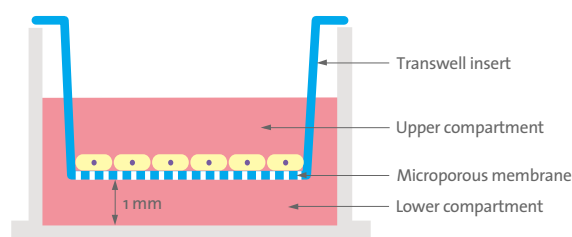
- ▶ Designed to produce a cell culture environment that closely resembles the *in vivo* state
- ▶ Allows polarized cells to feed basolaterally and thereby carry out metabolic activities in a more natural fashion
- ▶ Unique patented self-centered hanging design prevents medium wicking between the insert and outer well.
- ▶ Permits access to the lower compartment through windows in the insert wall
- ▶ Suspended design allows for undamaged co-culturing of cells in the lower compartment
- ▶ Available in a range of pore sizes and different membranes to satisfy diverse experimental requirements

## Characteristics of Transwell® Membranes

Characteristics	Polyester (PET)	Polycarbonate	PTFE/Collagen
Optical properties	Clear	Translucent	Clear when wet
Cell visibility	Good	Poor	Cell outlines
Tissue culture treated	Yes	Yes	No
Membrane thickness	10 µm	10 µm	50 µm
Matrix/ECM coatable	Yes	Yes	Yes
Collagen treated	No	No	Yes
Available Pore Sizes (µm)	0.4, 3.0	0.1, 0.4, 3.0, 5.0, 8.0, 12.0	0.4, 3.0

### Chemical Compatibility

All of the Transwell membranes are compatible with histological fixatives including methanol and formaldehyde. The polyester Transwell membranes have the best overall chemical resistance. These membranes (but not the polystyrene housings) are compatible with many alcohols, amines, esters, ethers, ketones, oils and some solvents, including many halogenated hydrocarbons and DMSO but are not recommended for use with strong acids and bases.



### Transwell® Permeable Supports Tip

Check the Corning web site ([www.corning.com/lifesciences](http://www.corning.com/lifesciences)) for an extensive list of references, listed by application, citing the use of Transwell permeable supports in cell culture research.

### Pore Density

Of the three types of Transwell membranes, only the PTFE does not have a defined pore density because it is a tortuous path membrane. The two membranes with a nominally defined pore density are polycarbonate and polyester. The polyester Transwell membranes do not have as high a pore density as the polycarbonate Transwell but have better optical clarity as a result. The nominal pore densities for Corning® Polycarbonate and Polyester (PET) membranes are given in the following table.

### Nominal Pore Densities for Transwell Polyester and Polycarbonate Membranes

Pore Size	Nominal Pore Density	
	Polycarbonate Membrane Transwell (pores/cm <sup>2</sup> )	Transwell-Clear Polyester Membrane (pores/cm <sup>2</sup> )
0.1 µm	3 x 10 <sup>8</sup>	n/a
0.4 µm	1 x 10 <sup>8</sup>	4 x 10 <sup>6</sup>
3.0 µm	2 x 10 <sup>6</sup>	2 x 10 <sup>6</sup>
5.0 µm	4 x 10 <sup>5</sup>	n/a
8.0 µm	1 x 10 <sup>5</sup>	n/a
12.0 µm	1 x 10 <sup>5</sup>	n/a

### Growth Areas and Recommended Medium Volumes for Transwell Permeable Supports

Transwell Insert Diameter (mm)	Insert Membrane Growth Area (cm <sup>2</sup> )	Multiple Well Plate or Dish Type	Volume Added per Plate Well	Volume Added to Inside of Transwell Insert (mL)
4.26	0.143	96 HTS	–	–
6.5	0.33	24 well	0.6	0.1
12	1.12	12 well	1.5	0.5
24	4.67	6 well	2.6	1.5
75	44	100 mm dish	13	9



3401 12 mm Polycarbonate Transwell Insert



3419 75mm Polycarbonate Transwell Insert

### Transwell® Polycarbonate Membrane Insert

- ▶ 10 µm translucent membrane
- ▶ Pore sizes ranging from 0.1 µm to 12 µm
- ▶ Treated for optimal cell attachment
- ▶ Supplied in multiple well plates
- ▶ Membrane must be stained for cell visibility
- ▶ Sterilized by gamma radiation

#### Transwell Polycarbonate Membrane Permeable Support Ordering Information

Cat. No.	Membrane Diameter (mm)	Growth Surface Area (cm <sup>2</sup> )	Membrane Pore Size (µm)	Tissue Culture Treated	Inner Packaging*	Inserts/Cs
3413	6.5	0.33	0.4	Yes	12/plate*	48
3415	6.5	0.33	3.0	Yes	12/plate*	48
3421	6.5	0.33	5.0	Yes	12/plate*	48
3422	6.5	0.33	8.0	Yes	12/plate*	48
3423	6.5	0.33	0.1	No	12/plate*	48
3401	12	1.12	0.4	Yes	12/plate	48
3402	12	1.12	3.0	Yes	12/plate	48
3403	12	1.12	12.0	Yes	12/plate	48
3412	24	4.67	0.4	Yes	6/plate	24
3414	24	4.67	3.0	Yes	6/plate	24
3428	24	4.67	8.0	Yes	6/plate	24
3419	75	44	0.4	Yes	1/dish	12
3420	75	44	3.0	Yes	1/dish	12

\*6.5 mm membrane diameter are packaged 12 inserts in a 24 well plate, 4 plates per case.

### Transwell-Clear Polyester Membrane Insert

- ▶ 10 µm transparent membrane
- ▶ Treated for optimal cell attachment
- ▶ Excellent visibility under phase contrast microscopy
- ▶ Supplied in multiple well plates
- ▶ Sterilized by gamma radiation



3450 24 mm Transwell-Clear Insert

#### Transwell-Clear Insert Ordering Information

Cat. No.	Membrane Diameter (mm)	Growth Surface Area (cm <sup>2</sup> )	Membrane Pore Size (µm)	Inner Packaging*	Inserts/Cs
3450	24	4.67	0.4	6/plate	24
3452	24	4.67	3.0	6/plate	24
3460	12	1.12	0.4	12/plate	48
3462	12	1.12	3.0	12/plate	48
3470	6.5	0.33	0.4	12/plate*	48
3472	6.5	0.33	3.0	12/plate*	48

\*6.5 mm membrane diameter are packaged 12 inserts in a 24 well plate, 4 plates per case.



3491 24 mm Transwell-COL Collagen-Coated Insert

### Transwell®-COL Collagen-Coated Membrane Insert

- ▶ Transparent collagen treated PTFE membrane
- ▶ Promotes cell attachment and spreading
- ▶ Equimolar mixture of types I and III collagen
- ▶ Individually packaged
- ▶ Multiple well plates included in each case
- ▶ Supplied sterile

#### Transwell-COL Insert Ordering Information

Cat. No.	Membrane Diameter (mm)	Growth Surface Area (cm <sup>2</sup> )	Membrane Pore Size (µm)	Inner Packaging	Cluster	Inserts/Cs
3491	24	4.7	0.4	Individual	6 well	24
3492	24	4.7	3.0	Individual	6 well	24
3493	12	1.1	0.4	Individual	12 well	24
3494	12	1.1	3.0	Individual	12 well	24
3495*	6.5	0.3	0.4	Individual	24 well	24
3496*	6.5	0.3	3.0	Individual	24 well	24

\*Includes twenty-four 6.5 mm inserts packaged separately with two 24 well plates.

### Snapwell™ Inserts

- ▶ A modified Transwell® permeable support containing a 12 mm diameter membrane supported by a detachable ring
- ▶ Once cells are grown to confluence on the Snapwell insert, the ring can be placed in a vertical or horizontal diffusion chamber\*
- ▶ Sterilized by gamma radiation
- ▶ Packaged in 6 well plates



3407 12 mm Snapwell Inserts

#### Snapwell Insert Ordering Information

Cat. No.	Membrane Pore Size (µm)	Membrane	Inner Packaging	Inserts/Cs
3407	0.4	Polycarbonate	6/plate	24
3802	3.0	Polycarbonate	6/plate	24
3801	0.4	Clear Polyester	6/plate	24

\*Diffusion Chambers are available through Harvard Apparatus ([www.harvardapparatus.com](http://www.harvardapparatus.com))



3396 6.5 mm HTS Transwell Polycarbonate Insert

### Corning® HTS Transwell®-24 Membrane Insert

- ▶ Treated for optimal cell attachment
- ▶ Available in two pore sizes: 0.4 and 3.0  $\mu\text{m}$  and, membrane types polycarbonate (PC) and polyester (PET)
- ▶ Individual or bulk pack
- ▶ Individual pack has 2 HTS Transwell-24 units loaded into 24 well plates and two open reservoirs
- ▶ Bulk pack has 12 HTS Transwell-24 units loaded into 24 well plates only. Reservoirs may be purchased separately
- ▶ Sterilized by gamma radiation

#### HTS Transwell Insert Ordering Information

Cat. No.	Description	Membrane Pore Size ( $\mu\text{m}$ )	Membrane	Qty/Pk	Plates/Cs
3396	HTS Transwell-24, individual	0.4	PC	1	2
3397	HTS Transwell-24, bulk	0.4	PC	12	12
3398	HTS Transwell-24, individual	3.0	PC	1	2
3399	HTS Transwell-24, bulk	3.0	PC	12	12
3395	HTS Transwell nontreated reservoir	–	PC	12	48
3378	HTS Transwell-24, bulk	0.4	PET	12	12
3379	HTS Transwell-24, individual	0.4	PET	1	2

### Corning HTS Transwell-96 Tissue Culture Systems

- ▶ 96 well system, polycarbonate (PC) membrane, 0.4  $\mu\text{m}$  pore size
- ▶ 96 well system, polyester (PET) membrane, 1.0  $\mu\text{m}$  pore size
- ▶ 0.143  $\text{cm}^2$  membrane area per well, providing 20 to 50% more surface area for cell growth than other commercially available systems
- ▶ Large apical and basolateral access ports allow efficient media sampling and facilitate automated or manual access
- ▶ Optimized for automation, with multichannel feeder ports, improved gripping surface, and standard bar codes



HTS Transwell-96 System

#### HTS Transwell-96 Systems Ordering Information

Cat. No.	Product Description	Qty/Pk	Qty/Cs
3380	HTS Transwell-96 System, 1.0 $\mu\text{m}$ PET membrane, reservoir, and receiver plates, with 2 sterile lids	1	1
3392	HTS Transwell-96 System, 1.0 $\mu\text{m}$ PET membrane, reservoir, and receiver plates, with 2 sterile lids	1	5
3381	HTS Transwell-96 System, 0.4 $\mu\text{m}$ PC membrane, reservoir, and receiver plates, with 2 sterile lids	1	1
3391	HTS Transwell-96 System, 0.4 $\mu\text{m}$ PC membrane, reservoir, and receiver plate, with 2 sterile lids	1	5
3382	HTS Transwell-96 Receiver Plate with lid	10	10
3383	HTS Transwell-96 Reservoir Plate (Feeder) with removable media stabilizer and lid	10	10
3389	Micromatic 8 Channel Aspirator for HTS Transwell-96 System, Autoclavable	1	1



Micromatic™ 8 Channel Aspirator





Netwell Inserts

### Netwell™ Inserts

- ▶ Costar® Netwell inserts have polyester mesh bottoms attached to polystyrene inserts
- ▶ They are used as tissue carriers, supports and strainers for culture of small organs, tissue slices or explants at the air-media interface
- ▶ Handy carrier during immunocytochemical staining of tissue slices (see accessories below)
- ▶ Provides coarse filtration of tissue homogenates, cell suspensions and microcarriers
- ▶ Available in two mesh sizes and diameters
- ▶ Supplied sterile and preloaded in 6- or 12-well microplates
- ▶ 24 mm Netwell inserts fit in Corning 50 mL plastic centrifuge tubes

### Netwell Inserts Ordering Information

Cat. No.	Membrane Dia. (mm)	Polyester Membrane Mesh Size (µm)	Sterile	Inner Packaging	Inserts/Cs
3477	15	74	Yes	12/plate	48
3478	15	500	Yes	12/plate	48
3479	24	74	Yes	6/plate	48
3480	24	500	Yes	6/plate	48

### Netwell Accessories

- ▶ Specially designed Netwell carriers and handles allow simultaneous processing of up to 12 samples per carrier
- ▶ Polystyrene reagent trays are available in white for colorimetric reaction contrast, or black for better visibility of tissue sections
- ▶ Each carrier kit contains eight carriers and eight handles

### Netwell Accessories Ordering Information

Cat. No.	Description	Qty/Cs
3517	Netwell Reagent Tray, black	200
3519	Netwell Reagent Tray, white	200
3520	Netwell Carrier Kit, 15 mm	8
3521	Netwell Carrier Kit, 24 mm	8



Netwell Accessories

## Culture Tubes



430172 Culture Tube

### Culture Tubes

- ▶ Manufactured from optically clear polystyrene
- ▶ Threaded plug seal caps prevent leakage
- ▶ Cell culture treated tubes supplied racked
- ▶ Untreated tubes provided bulk packed
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

### Culture Tube Ordering Information

Cat. No.	Treated	Size (mm)	Cap Style	Qty/Pk	Qty/Cs
430157	No	16 x 125	Screw top	25	500
430172	Yes	16 x 125	Screw top	50	500

## Roller Bottles



430849 850 cm<sup>2</sup> Roller Bottle

### Roller Bottles

- ▶ Manufactured from virgin polystyrene
- ▶ Treated for optimal cell attachment
- ▶ One piece seamless construction
- ▶ Most bottles have printed graduations.
- ▶ All bottles have printed lot numbers to aid in product traceability.
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

### Roller Bottle Ordering Information

Cat. No.	Surface	Surface Area (cm <sup>2</sup> )	Cap Style	Graduations	Qty/Pk	Qty/Cs
430195	TC	490	Plug Seal	No	2	40
430699	TC	1,750	Easy Grip	Yes	10	20
430849	TC	850	Easy Grip	Yes	2	36
431133	TC	850	Easy Grip	Yes	20	20
431198	TC	850	Easy Grip Vent	Yes	2	36
430851	TC	850	Easy Grip	Yes	6	36
3907	Corning® CellBIND® Surface	850	Easy Grip	Yes	2	36
431329	Corning CellBIND Surface	850	Easy Grip Vent	Yes	2	36

### Expanded Surface Roller Bottles

- ▶ Same features as standard roller bottles
- ▶ Ribbed design provides twice the surface area with the same exterior dimensions

### Expanded Surface Roller Bottle Ordering Information

Cat. No.	Surface	Surface Area (cm <sup>2</sup> )	Cap Style	Graduations	Qty/Pk	Qty/Cs
430852	TC	1,700	Easy Grip	Yes	2	36
430853	TC	1,700	Easy Grip	Yes	6	36
431134	Corning CellBIND Surface	1,700	Easy Grip	Yes	20	20
431135	TC	1,700	Easy Grip	Yes	20	20
431191	TC	1,700	Easy Grip Vent	Yes	20	20



430852 Expanded Surface Roller Bottle

### Expected Cell Yields and Recommended Medium Volumes

Corning® Roller Bottles	Approximate Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Recommended Medium Volume (mL)
490 cm <sup>2</sup> roller bottle	490	4.9 x 10 <sup>7</sup>	100 - 150
850 cm <sup>2</sup> roller bottle	850	8.5 x 10 <sup>7</sup>	170 - 255
1700 cm <sup>2</sup> roller bottle	1,700	1.7 x 10 <sup>8</sup>	340 - 510
1750 cm <sup>2</sup> roller bottle	1,750	1.75 x 10 <sup>8</sup>	350 - 525

\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture. Yields from many cell types can be lower than this.

## Polyethylene Roller Bottle Caps

Caps are sold separately and are available individually wrapped in either Easy Grip or Easy Grip Vent Cap designs

### Roller Bottle Application Tips

- ▶ Corning recommends 0.2 to 0.3 mL of medium per cm<sup>2</sup> of growth area.
- ▶ Corning recommends setting roller rack speeds to provide 0.5 to 1.0 RPM.

Cat. No.	Cap Style	Qty/Pk	Qty/Cs
430698	Easy Grip	1	100
431132	Easy Grip Vent	1	300



**Easy Grip Cap** features large knurls designed for ergonomic handling.



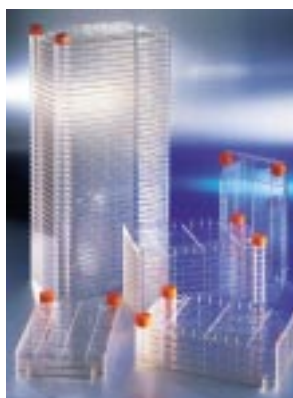
**Easy Grip Vent Cap** is designed for applications requiring consistent gas exchange.



**Plug Seal Cap**, designed for use in closed systems, provides a liquid- and gas-tight seal. When loosened, this cap can be used in open systems.

**Corning is committed to partnering with you**, our customer, to provide solutions that increase your efficiency and productivity. We offer the ability to customize packaging and cap design to meet your specific requirements. Minimum order quantities apply. Please call us or contact your local Corning Office for more details. See back cover for contact information.

## Corning® CellSTACK® Culture Chambers



Corning CellSTACK Culture Chambers

- ▶ Available in Five Sizes
  - 1-Stack with 636 cm<sup>2</sup> cell growth area
  - 2-Stack with 1,272 cm<sup>2</sup> cell growth area
  - 5-Stack with 3,180 cm<sup>2</sup> cell growth area
  - 10-Stack with 6,360 cm<sup>2</sup> cell growth area
  - 40-Stack with 25,440 cm<sup>2</sup> cell growth area
- ▶ Greater Chamber Durability
  - Superior mechanical strength and structural integrity
  - Self-venting caps prevent pressure build-up during transport
  - 100% leak tested prior to shipping
- ▶ Greater Cleanliness
  - Improved assembly procedures reduce particulates
  - Certified nonpyrogenic and sterilized by gamma irradiation
- ▶ Continuous Supply Reliability
  - Manufactured in USA under GMP conditions
- ▶ Easier to Use
  - Larger openings with threaded closures and vented caps
  - Footprint identical to competitor's product

**Corning® CellSTACK® Culture Chambers Ordering Information**



CellSTACK Chamber, 40-Stack

Cat. No.	Surface	Growth Area (cm <sup>2</sup> )	Description	Qty/ Pk	Pk/ Cs
3330	Corning® CellBIND® Surface	636	CellSTACK Chamber, 1-Stack	1	8
3268	TC	636	CellSTACK Chamber, 1-Stack	1	8
3310	Corning CellBIND Surface	1,272	CellSTACK Chamber, 2-Stack	1	5
3269	TC	1,272	CellSTACK Chamber, 2-Stack	1	5
3311	Corning CellBIND Surface	3,280	CellSTACK Chamber, 5-Stack	1	2
3319	TC	3,280	CellSTACK Chamber, 5-Stack	1	2
3313	TC	3,280	CellSTACK Chamber, 5-Stack	1	8
3312	Corning CellBIND Surface	6,360	CellSTACK Chamber, 10-Stack	1	2
3320	Corning CellBIND Surface	6,360	CellSTACK Chamber, 10-Stack	1	6
3270	TC	6,360	CellSTACK Chamber, 10-Stack	1	2
3271	TC	6,360	CellSTACK Chamber, 10-Stack	1	6
3321	Corning CellBIND Surface	25,440	CellSTACK Chamber, 40-Stack	1	2
3272	TC	25,440	CellSTACK Chamber, 40-Stack	1	2

**Corning CellSTACK Filling Accessories Ordering Information**



CellSTACK Accessories

Cat. No.	Description	Qty/ Pk	Qty/ Cs
3331	Stacking Device, ABS, nonsterile	1	5
3332	Universal Cap*, with vented overcap, sterile	1	4
3279	Solid cap, sterile	1	5
3280	Vent cap, 0.2 mm membrane, sterile	1	5
3281	Vent cap, 3/8" (9.5 mm) ID tubing, 7 cm length, Pall® Acro 50, PVDF filter, sterile	1	5
3282	Fill cap, 1/8" (3.2 mm) ID tubing, female luer lock with male luer plug, sterile	1	5
3283	Fill cap, 3/8" (9.5 mm) ID tubing and 5/16" (7.94 mm) barbed fitting, sterile	1	5
3284	Vent cap, 3/8" (9.5 mm) ID tubing, 7 cm length, Pall Bacterial Air Vent, sterile	1	4
3324	Two vented over caps and one solid over cap for the Universal Cap, sterile	1	5
3333	Fill cap*, 1/4" (6.4 mm) ID tubing, 70 cm length, male MPC coupling with female end cap, sterile	1	4
3328	Fill cap, female MPC coupling, 1/4" (6.4 mm) ID barbed fitting with male end cap, sterile	1	4
3329	Fill cap, female MPC coupling, 3/8" (9.5 mm) ID barbed fitting with male end cap, sterile	1	4
3334	Fill cap, male MPC coupling, 1/4" (6.4 mm) ID barbed fitting with female end cap, sterile	1	4
3339	Fill cap, male MPC coupling with male end cap, 3/8" (9.5 mm) ID barbed fitting with female end cap, sterile	1	4

\*All caps are 33 mm thread caps.



3328 Fill Cap, Female MPC Coupling

## CellCube® Systems



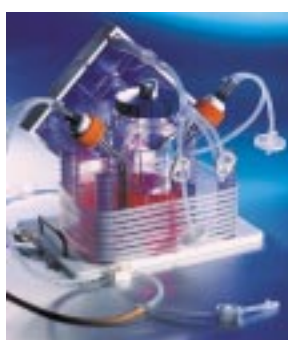
The CellCube System provides a fast, simple, and compact method for the mass culture of attachment-dependent cells. It uses a tissue culture treated growth surface for cell attachment, and continually perfuses the cells with fresh medium for increased cell productivity. The CellCube System is comprised of four pieces of capital equipment: the system controller, oxygenator, circulation, and media pumps and is designed to use disposable CellCube Modules. Performance data from the CellCube System can be easily scaled to the production system. Please inquire about CellCube System pricing. Corning provides on-site technical support for the CellCube System.

The CellCube Modules provide a traditional tissue culture treated surface for the growth of attachment dependent cells. The CellCube System provides an environment which more closely simulates *in vivo* conditions and reliably distributes nutrients and oxygen with low differential gradients across all cells within the modules.

### CellCube Ordering Information

Cat. No.	Description	Qty/Cs
3143	CellCube System; for use with CellCube Modules 3200, 3201, 3202, or 3203; consists of the following components:	
3220	CellCube System Controller	1
3101	CellCube Single Module System 6 Liter Oxygenator, Complete	1
3222	CellCube Digital Single Module System Circulation Pump	1
3221	CellCube Digital System Media Pump	1
3139	CellCube Single Module System Secondary Oxygen Probe (25 x 70 mm)	1
3138	CellCube Single Module System Secondary Oxygen Probe Holder	1
3144	CellCube Single Module System Oxygen Probe Cable	1
3165	CellCube Single Module System 12 mm Dissolved Oxygen Probe Membrane Kit	1
3166	CellCube System 25 mm Dissolved Oxygen Probe Membrane Kit	1
3136	CellCube Single Module System Stainless Steel Stand	1
3135	CellCube Single Module System Setup Kit	1

## Corning® E-Cube™ Culture System



Corning E-Cube Culture System

The E-Cube system provides a simple method to determine if your cells will grow in the CellCube® module prior to investing in the resources and funding that would be necessary for the larger, automated CellCube system.

### Corning E-Cube Culture System Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
3286	E-Cube System Kit (without CellCube module)	1	1
3200	CellCube Module 10-Stack	1	2

### Corning E-Cube Culture System Accessories Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
430518	1 L Storage Bottle with cap	2	24
401654	45 mm Cap with 2 stainless steel ports	1	1
3287	E-Cube Fittings	1	1



## Spinner Flasks



Disposable Spinner Flasks

### Corning® Disposable Spinner Flasks

- ▶ The Corning disposable spinner flask system comes ready-to-use with paddle and integrated magnet, eliminating the need for time-consuming assembly or cleaning and reassembly.
- ▶ Molded from virgin polystyrene and gamma-irradiated, each spinner flask system assures a clean sterile unit. No more concerns with detergent residues or contamination.
- ▶ Made of USP XXXIII Class VI polystyrene, the vessel is comparable to conventional glass spinner flasks for growth of suspension cell lines and any attachment-dependent cultures using microcarrier beads.
- ▶ The paddle size and height is optimized for each vessel size. A unique integrated magnet provides smooth, even rotation at required speeds on any laboratory stir-plate. Heat build-up in the vessel is reduced by means of a specially designed flange that raises the vessel off the stir-plate surface.

### Corning Disposable Spinner Flasks Ordering Information

Cat. No.	Description	Capacity (mL)	Center Neck (mm)	Sidearm Neck (mm)	Qty/Cs
3152	Disposable Spinner Flask	125	70	25	12
3153	Disposable Spinner Flask	500	100	45	12

### ProCulture® Glass Spinner Flask with Angled Sidearms

- ▶ Baffles enhance aeration and agitation of contents of the flask.
- ▶ Unique impeller design ensures optimal stirring.
- ▶ Sidearm designs permit easy access of 25 and 50 mL pipettes
- ▶ Visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences) to view additional Corning spinner flask accessories



4500-1L and 4500-250 Spinner Flasks

### ProCulture Spinner Flasks with Angled Sidearms Ordering Information

Cat. No.	Description	Capacity	Center Neck (mm)	Sidearm Neck (mm)	Qty/Cs
4500-125	Spinner	125 mL	70	32	1
4500-250	Spinner	250 mL	70	32	1
4500-500	Spinner	500 mL	100	45	1
4500-1L	Spinner	1L	100	45	1
4500-3L	Spinner	3L	100	45	1
4500-6L	Spinner	6L	100	45	1
4500-8L	Spinner	8L	100	45	1
4500-15L	Spinner	15L	100	45	1
4500-36L	Spinner	36L	100	45	1
4502-3L	Spinner	3L	120	45	1
4502-6L	Spinner	6L	120	45	1
4502-8L	Spinner	8L	120	45	1
4502-15L	Spinner	15L	120	45	1
4502-36L	Spinner	36L	120	45	1
4504-3L	Spinner	3L	140	45	1
4504-6L	Spinner	6L	140	45	1
4504-8L	Spinner	8L	140	45	1
4504-15L	Spinner	15L	140	45	1
4504-36L	Spinner	36L	140	45	1



ProCulture Spinner Flasks

Retrofit Kits are available for converting older Corning® ProCulture Spinner Flasks to fit newer dual-bearing impellers.



**ProCulture Spinner Flasks with Vertical Sidearms Ordering Information**

Cat. No.	Capacity	Center Neck (mm)	Number of Vertical Sidearms	Sidearm Neck (mm)	Qty/Cs
4510-8L	8L	100	4	45	1
4510-15L	15L	100	4	45	1
4510-36L	36L	100	6	45	1
4512-8L	8L	120	4	45	1
4512-15L	15L	120	4	45	1
4512-36L	36L	120	6	45	1
4514-15L	15L	140	4	45	1
4514-36L	36L	140	6	45	1



Vertical Sidearm Fittings, Gas Delivery and Venting

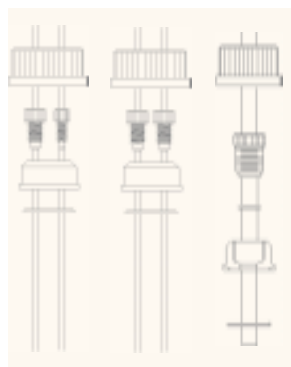
**Gas Handling Fittings, Vertical Sidearm Flasks**

- ▶ Used to provide gases into larger spinner flasks with vertical sidearms
- ▶ Fittings are comprised of a PET insert with a Viton® O-Ring and a polypropylene sealing cap
- ▶ Gas filters are PTFE, 0.2 micron porosity
- ▶ The 316 stainless steel tubes are held in place by Noryl® nuts with integrated ferrules
- ▶ The fittings are completely autoclavable

Cat. No.	Description	Dimension	Qty/Cs
4519-100	Sidearm fitting, gas delivery	1/8" Inlet	1
4519-102	Sidearm fitting, gas delivery	1/4" Inlet	1
4519-104	Sidearm fitting, delivery and vent	1/8" and 1/4"	1
4519-106	Sidearm fitting, vent cap, 0.2 μ	50 mm filter	1
4519-177	Sidearm fitting, vent cap, 0.2 μ, Sanitary	50 mm filter	1

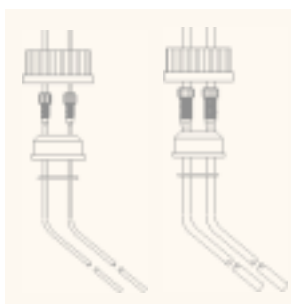
**Media Handling Fittings, Vertical Sidearm Flasks**

- ▶ Used to introduce medium aseptically into large spinner flasks with vertical sidearms
- ▶ Fittings are comprised of a PET insert with a Viton O-Ring and a polypropylene sealing cap
- ▶ Gas filters are PTFE, 0.2 micron porosity
- ▶ The 316 stainless steel tubes are held in place by Noryl nuts with integrated ferrules
- ▶ The fittings are completely autoclavable



Vertical Sidearm Fittings, Media Handling

Cat. No.	Description	Flask Size	Tubing O.D. (inches)	Qty/Case
4519-112	Sidearm fitting, dual, media handling	8L, 15L	1/8"	1
4519-114	Sidearm fitting, dual, media handling	36L	1/8"	1
4519-116	Sidearm fitting, dual, media handling	8L, 15L	1/4"	1
4519-118	Sidearm fitting, dual, media handling	36L	1/4"	1
4519-120	Sidearm fitting, combo, media handling	8L, 15L	1/8", 1/4"	1
4519-122	Sidearm fitting, combo, media handling	36L	1/8", 1/4"	1
4519-124	Sidearm fitting, single, media handling	8L, 15L	1/2"	1
4519-126	Sidearm fitting, single, media handling	36L	1/2"	1
4519-176	Sidearm fitting, dual, media handling, EPDM	8L, 15L	1/4"	1



Dual Angled Sidearm Fittings

### Gas or Media Handling Fittings, Angled Sidearm Flasks, Dual Style

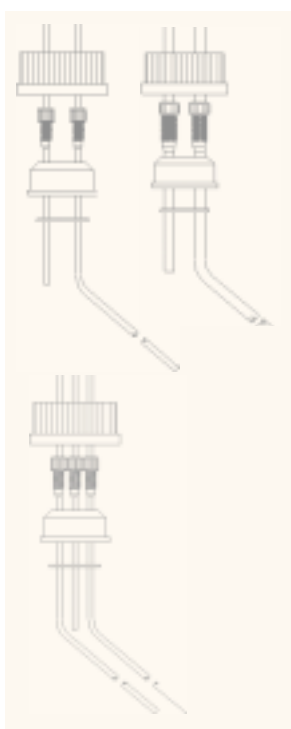
- ▶ Dual angled sidearm fittings can be used for aseptically transferring medium into or out of angled sidearm spinner flasks or for sparging the medium with gases.
- ▶ Fittings are comprised of a PET insert with a Viton® O-ring and a polypropylene sealing cap
- ▶ Two 316 stainless steel tubes which extend to the bottom of the flask, are held in place by Noryl® nuts with integrated ferrules
- ▶ The fittings are completely autoclavable

Cat. No.	Description	Flask Size	Tubing O.D. (inches)	Qty/ Case
4519-150	SA fitting, Dual	1L	1/8"	1
4519-151	SA fitting, Dual	3L	1/8"	1
4519-152	SA fitting, Dual	6L	1/8"	1
4519-153	SA fitting, Dual	8L	1/8"	1
4519-173	SA fitting, Dual	1L	1/8", 1/4"	1
4519-121	SA fitting, Dual	8L	1/8", 1/4"	1
4519-174	Sidearm fitting, Dual	500 mL	1/8" angled to 125 mL level, 1/4"	1
4519-154	Sidearm fitting, Dual	1L	1/4"	1
4519-155	Sidearm fitting, Dual	3L	1/4"	1
4519-156	Sidearm fitting, Dual	6L	1/4"	1
4519-157	Sidearm fitting, Dual	8L	1/4"	1
4519-170	Sidearm fitting, Dual	15L	1/4"	1

### Gas or Media Handling Fittings, Angled Sidearm Flasks, Combination Style

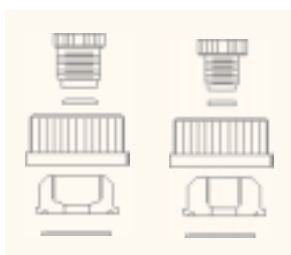
- ▶ Used to aseptically transfer medium, sparge the cell culture medium directly or add gases to the head space above the cell culture medium
- ▶ Fittings are comprised of a PET insert with a Viton O-ring and a polypropylene sealing cap
- ▶ One or two 316 stainless steel tubes extend to the bottom of the flask; the other is a shorter 6" length
- ▶ Both tubes are held in place by Noryl nuts with integrated ferrules

The fittings are completely autoclavable



Combination and Triple Angled Sidearm Fittings

Cat. No.	Description	Flask Size	Tubing O.D. (inches)	Qty/Case
4519-158	Sidearm fitting, combination	1L	1/8"	1
4519-159	Sidearm fitting, combination	3L	1/8"	1
4519-160	Sidearm fitting, combination	6L	1/8"	1
4519-161	Sidearm fitting, combination	8L	1/8"	1
4519-162	Sidearm fitting, combination	1L	1/4"	1
4519-163	Sidearm fitting, combination	3L	1/4"	1
4519-164	Sidearm fitting, combination	6L	1/4"	1
4519-165	Sidearm fitting, combination	8L	1/4"	1
4519-171	Sidearm fitting, combination	15L	1/4"	1
4519-166	Sidearm fitting, combination, triple	1L	1/8"	1
4519-167	Sidearm fitting, combination, triple	3L	1/8"	1
4519-168	Sidearm fitting, combination, triple	6L	1/8"	1
4519-169	Sidearm fitting, combination, triple	8L	1/8"	1



18 mm      12 mm

Sidearm Fittings for Sensors

### Fittings for Insertion Probes, Vertical Sidearm Flasks

- ▶ Used to secure pH, O<sub>2</sub>, or temperature sensors in large spinner flasks with vertical sidearms
- ▶ Fittings are comprised of a PET insert with a Viton® O-ring and a polypropylene sealing cap
- ▶ The 316 sensors are held in place by Noryl® nuts with integrated ferrules
- ▶ The fittings are completely autoclavable

Cat. No.	Description	Sensor O.D. (mm)	Qty/Cs
4519-108	Sidearm fitting, sensor, O <sub>2</sub> probes	12	1
4519-128	Sidearm fitting, sensor, temperature probes	12	1
4519-110	Sidearm fitting, sensor, pH probes	12	1
4519-172	Sidearm fitting, sensor, pH or O <sub>2</sub>	18	1

### Impeller Assembly for Magnetically-Driven Bioreactor

Stainless steel impeller shaft with modified impeller blade for use with probes to create a small bioreactor.



Impeller Assembly

Cat. No.	Description	Qty/Cs
402648	Impeller assembly, stainless steel, dual bearing, modified for probes, 3L	1
402649	Impeller assembly, stainless steel, dual bearing, modified for probes, 6L	1
401392	Impeller assembly, stainless steel, dual bearing, modified for probes, 8L	1
401661	Impeller assembly, stainless steel, dual bearing, modified for probes, 15L	1
402650	Impeller assembly, stainless steel, dual bearing, modified for probes, 36L	1

### Cap Assembly for Magnetically-Driven Bioreactor

Cap assembly for small bioreactor with various fitting arrangements.

Cat. No.	Description	Qty/Cs
402579	Cap Assembly, 120 mm, Noryl, 3 (3/8"), 1 (1/4") fittings	1
402576	Cap Assembly, 120 mm, Noryl, 2 (12 mm), 2 (1/4") fittings	1
402577	Cap Assembly, 120 mm, Noryl, 2 (12 mm), 2 (1/4"), 1 (3/8") fittings	1

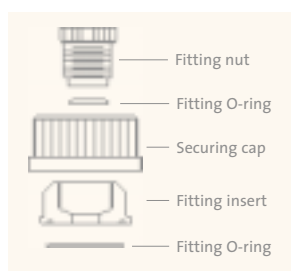
### Spare Parts for Sidearm Fittings

#### Securing Caps

Cat. No.	Description	Qty/Cs
402681	Cap, securing, 45 mm, bored, orange	1
402720	Cap, securing, 45 mm, bored, for injection septum, white	1
1395-32LTC	Cap, securing, 32 mm, orange	1
1395-45LTC	Cap, securing, 45 mm, orange	1
1395-45LTR	Drip ring, 45 mm, clear	1
1395-45LTMC	Cap, vented, securing, 45 mm, .22 PTFE, grey	10

#### Fitting inserts

Cat. No.	Description	Qty/Cs
402678	Insert, 45 mm, PET, for single 1/8" inlet	1
402685	Insert, 45 mm, PET, for single 1/4" inlet	1
402063	Insert, 45 mm, PET, for 50 mm filter	1
402068	Insert, 45 mm, PET, for 12 mm insert probe	1
402688	Insert, 45 mm, PET, for 18.9 mm insert probe	1
402690	Insert, 45 mm, PET, for 10 mm insert probe	1
402072	Insert, 45 mm, PET, for dual 1/8" inlet	1
402074	Insert, 45 mm, PET, for dual 1/4" inlet	1
402076	Insert, 45 mm, PET, for fitting 1/8" and 1/4"	1



**Spare Parts for Sidearm Fittings (continued)***Fitting Nuts*

Cat. No.	Description	Qty/Cs
402682	Nut, 1/8", Noryl®	1
402686	Nut, 1/4", Noryl	1
402069	Nut, 12.4 mm, Noryl	1
402689	Nut, 18.9 mm, Noryl	1
402691	Nut, 10 mm, Noryl	1

*Fitting O-rings*

Cat. No.	Description	Qty/Cs
402679	O-ring, insert, Viton® #026	1
402071	O-ring, for 12.4 mm nut	1
402692	O-ring, for 10 mm nut	1

*Fitting Filters and Sparging Stones*

Cat. No.	Description	Qty/Cs
402064	Filter, 50 mm, PTFE, 0.2 µm, double NPT	1

*Sidearm Septum Fittings*

Cat. No.	Description	Qty/Cs
402711	Septum, GL-45, black butyl rubber	1

*Straight Stainless Steel Tubing*

Cat. No.	Description	Qty/Cs
402684	Tubing, 316 stainless steel, 1/8" OD, 18", straight	1
402073	Tubing, 316 stainless steel, 1/8" OD, 21", straight	1
402698	Tubing, 316 stainless steel, 1/8" OD, 6", straight	1
402687	Tubing, 316 stainless steel, 1/4" OD, 18", threaded straight	1
402075	Tubing, 316 stainless steel, 1/4" OD, 21", straight	1
402077	Tubing, 316 stainless steel, 1/2" OD, 18", straight	1
402078	Tubing, 316 stainless steel, 1/2" OD, 21", straight	1

*Angled Stainless Steel Tubing*

Cat. No.	Description	Qty/Cs
401637	Tubing, 316 stainless steel, 1/8", 500 mL, angled, to 250 mL level	1
401640	Tubing, 316 stainless steel, 1/8", 1L, angled, to 250 mL level	1
402694	Tubing, 316 stainless steel, 1/8", 1L, angled	1
402695	Tubing, 316 stainless steel, 1/8", 3L, angled	1
402696	Tubing, 316 stainless steel, 1/8", 6L, angled	1
402697	Tubing, 316 stainless steel, 1/8", 8L, angled	1
401651	Tubing, 316 stainless steel, 1/4", 500 mL, angled	1
401638	Tubing, 316 stainless steel, 1/4", 1L, angled	1
401643	Tubing, 316 stainless steel, 1/4", 3L, angled	1
402699	Tubing, 316 stainless steel, 1/4", 6L, angled	1
402700	Tubing, 316 stainless steel, 1/4", 8L, angled	1

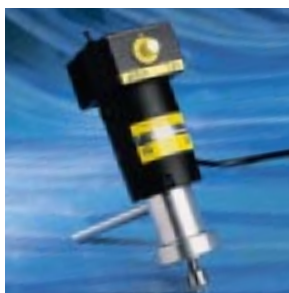
### Spare Parts for Center Neck Cap Fittings

#### Center Neck Compression Fitting Parts

Cat. No.	Description	Qty/Cs
402103	Fitting, 1/4", bulkhead type, modified	1

#### Fitting Plugs

Cat. No.	Description	Qty/Cs
402079	Plug, 1/8", Delrin	1
402099	Plug, 1/4", Delrin	1



Direct Drive Motor

#### Direct Drive Motors

- ▶ High torque, low rpm stirrer designed to maintain constant low speed
- ▶ Gearhead stirrer delivers 14.5 in-lbs of torque
- ▶ Maximum speed is 350 rpm
- ▶ Weight of motor is 9 lbs (4.1kg)
- ▶ Available with 120VAC 60Hz or 230VAC 50Hz

Cat. No.	Description	Qty/Cs
400640	120VAC, 60 Hz Motor	1
402645	230VAC, 50 Hz Motor	1



Direct Drive Shaft/Cap Assembly

#### Direct Drive Shaft/Cap Assemblies

- ▶ For 8L, 15L, or 36L paddle assemblies
- ▶ Used on all series 4510 and 4512 Spinner flasks

Cat. No.	Description	Qty/Cs
4520-104	For 100 mm Neck Flasks	1
4520-106	For 120 mm Neck Flasks	1

#### Direct Drive Paddle Assemblies

- ▶ For series 4510, 4512, and 4514 Spinner flasks when coupled to a direct drive motor
- ▶ Paddle assemblies will couple to 100 mm and 120 mm cap assemblies

Cat. No.	Description	Qty/Cs
4515-8L	Paddle assembly only for 8L flask	1
4515-15L	Paddle assembly only for 15L flask	1
4515-36L	Paddle assembly only for 36L flask	1



Direct Drive Paddle Assembly

## Erlenmeyer Flasks



431146 1L Erlenmeyer Flask

### Shaker Flask Application Tip

Corning recommends starting with a shaking rate of 75-125 RPM (orbital shaker) and a medium volume of 30-40% of the nominal flask capacity.

### Erlenmeyer Flasks

- Made from optically clear polycarbonate
- Ideal for shaker culture applications
- Two-position polypropylene plug seal cap can be opened for gas exchange or closed for a liquid-tight seal
- Vent caps available for applications requiring sterile gas exchange
- Sterilized by gamma radiation
- Certified nonpyrogenic

### Erlenmeyer Flask Ordering Information

Cat. No.	Capacity (mL)	Graduation (mL)	Neck Diameter (mm)	Cap Style	Qty/Pk	Qty/Cs
430421	125	25	26	Plug seal	1	50
431143	125	25	26	Vent cap	1	50
430183	250	25	31	Plug seal	1	50
431144	250	25	31	Vent cap	1	50
430422	500	50	43	Plug seal	1	25
431145	500	50	43	Vent cap	1	25
431146	1000	50	43	Plug seal	1	25
431147	1000	50	43	Vent cap	1	25

### 2L and 3L Polycarbonate Flasks

- Made from optically clear polycarbonate
- Ideal for shaker culture applications
- Available in baffled and nonbaffled bottoms
- Vent caps supplied in every case of product for applications requiring sterile gas exchange
- Sterilized by gamma radiation
- Certified nonpyrogenic

### Polycarbonate Flask Ordering Information

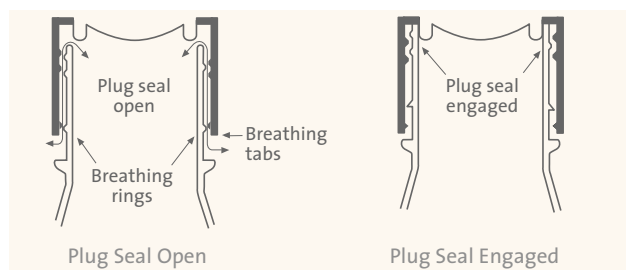
Cat. No.	Description	Sterile	Qty/Cs
431255	Erlenmeyer Flask, 2L, polycarbonate	Yes	6
431256	Erlenmeyer Flask, 2L, polycarbonate, baffled bottom	Yes	6
431252	Fernbach Culture Flask, 3L, polycarbonate	Yes	4
431253	Fernbach Culture Flask, 3L, polycarbonate, baffled bottom	Yes	4
431339	Cap, Vented, 48 mm for 2L flask	Yes	24
431340	Cap, Vented, 70 mm for 3L flask	Yes	24



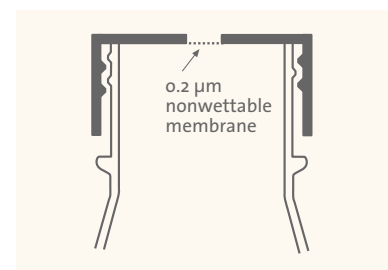
431256 2L Erlenmeyer Flask



431253 3L Fernbach Culture Flask



**Breathable two-position plug seal caps** feature one-piece linerless construction with a flexible plug for a gas- and liquid-tight seal. In addition, the unique breathable cap design allows use in either an open or closed mode.



**Vent caps** contain a 0.2 µm nonwetable membrane sealed to the cap, providing consistent, sterile gas exchange while minimizing the risk of contamination.



## Cell Scrapers and Lifters



3008 Cell Lifter

### Cell Scrapers and Cell Lifters

- ▶ Useful for the manual harvesting of cells
- ▶ Blade design minimizes cell damage and ensures even contact with the growth surface
- ▶ Cell lifter is useful for harvesting cells in dishes
- ▶ Scrapers designed for use in flasks
- ▶ Individually wrapped
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

### Cell Scraper and Lifter Ordering Information

Cat. No.	Description	Blade Length (cm)	Handle Length (cm)	Qty/Pk	Qty/Cs
3008	Cell lifter	1.9	18	1	100
3010	Small scraper	1.8	25	1	100
3011	Large scraper	3.0	39	1	100



3010 Small Cell Scraper

## Spatulas and Microspatulas



Spatulas

- ▶ Corning® spatulas are designed to save researcher's time and to provide them with contamination-free samples
- ▶ Each spatula is individually packaged, certified RNase-/DNase-free, nonpyrogenic, antistatic, and sterile
- ▶ They are specifically targeted toward researchers interested in eliminating the recycling and resterilizing necessary with reusable spatulas
- ▶ Spatulas are available in five different configurations

### Spatulas Ordering Information

Cat. No.	Description	Qty/Cs
3003	Spatula, Tapered Blade/Spoon	100
3004	Spatula, Small Spoon/Spoon	100
3005	Spatula, Round End/Spoon	100
3006	Spatula, V-Scoop/Spoon	100
3007	Spatula, Flat End/Spoon	100
3012	Microspatula, tapered end/scoop	50
3013	Microspatula, rounded end/scoop	50



Microspatulas

# Pipets



Stripette Serological Pipets

## Stripette® Serological Pipets

- ▶ Exclusive antidrip tip assures accurate delivery
- ▶ Available in 25, 50, and 100 mL sizes
- ▶ Color-coded magnifier stripes make volume reading easier
- ▶ Bidirectional graduations provide choice of ascending and descending scales
- ▶ Negative graduations allow additional working volume
- ▶ Four packaging options:
  - Individually wrapped, clear plastic
  - Individually wrapped, paper/plastic
  - Bulk packed for large-scale sterile and nonsterile liquid handling applications
  - Clean room packed; individually wrapped, paper/plastic, triple bagged

### Stripette Pipets Ordering Information

Cat. No.	Capacity (mL)	Graduations (mL)	Negative Grads. (mL)	Color Coded Stripe	Qty/Pk	Qty/Cs
<i>Individually Wrapped, Clear Plastic Wrap</i>						
4011	1	1/100	0.2	Yellow	100/bag	1,000
4012	1	1/100	0.2	Yellow	100/bag	200
4021	2	1/100	0.2	Green	100/bag	1,000
4051	5	1/10	2.5	Blue	50/bag	200
4101	10	1/10	3.0	Orange	50/bag	200
4492*	10	1/10	3.0	Orange	50/bag	200
4251	25	2/10	10.0	Red	50/bag	200
4501	50	1/2	10.0	Purple	25/bag	100
4484	100	1	N/A	Aqua	10/bag	100
<i>Individually Wrapped, Paper/Plastic Wrap</i>						
4485	1	1/100	0.2	Yellow	50/bag	1,000
4486	2	1/100	0.2	Green	50/bag	1,000
4487	5	1/10	2.5	Blue	50/bag	200
4488	10	1/10	3.0	Orange	50/bag	200
4489	25	2/10	10.0	Red	25/bag	200
4490	50	1/2	10.0	Purple	25/bag	100
4491	100	1/1	N/A	Aqua	10/bag	100
<i>Bulk Packed in Bags</i>						
4010	1	1/100	0.2	Yellow	50/bag	1,000
4020	2	1/100	0.2	Green	50/bag	1,000
4050	5	1/10	2.5	Blue	50/bag	500
4100	10	1/10	3.0	Orange	50/bag	500
4250	25	2/10	10.0	Red	25/bag	200
4500	50	1/2	10.0	Purple	25/bag	100
<i>Clean Room Pack, Individually Wrapped, Paper/Plastic, Triple Bagged</i>						
7015	10	1/10	3.0	Orange	50/bag	200
7016	25	2/10	10.0	Red	25/bag	200
7017	50	1/2	10.0	Purple	25/bag	100
7000	100	1/1	N/A	Aqua	10/bag	100

\*Cat. No. 4492 features a wide tip for handling viscous fluids.






Three packaging options



Exclusive Antidrip Tip

# Cryogenic Vials and Accessories

Corning offers three styles of cryogenic vials as well as storage racks and boxes.

 <p><b>External Thread Cryogenic Vial</b></p> <ul style="list-style-type: none"> <li>▶ Color-coded polypropylene cap inserts simplify vial identification. Available in variety packs of white, blue, green, red, and yellow.</li> <li>▶ Silicone washer provides a secure seal.</li> <li>▶ Easy-to-read black graduations for partial volumes</li> <li>▶ Self-standing base, self-locking skirt</li> </ul>	 <p><b>Internal Thread Cryogenic Vial</b></p> <ul style="list-style-type: none"> <li>▶ Color-coded polypropylene cap inserts simplify vial identification. Available in variety packs of white, blue, green, red, and yellow.</li> <li>▶ Silicone washers or rubber O-rings provide a secure seal.</li> <li>▶ Easy-to-read black graduations for partial volumes</li> <li>▶ Self-standing base, self-locking skirt</li> </ul>	 <p><b>External Thread Plug Seal Cap</b></p> <ul style="list-style-type: none"> <li>▶ Sure-grip plug seal screw cap</li> <li>▶ Inner cap ring assures a tight seal.</li> </ul>
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**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.

## External Thread Cryogenic Vials

- ▶ Manufactured from polypropylene to withstand temperatures down to -196°C
- ▶ Larger marking spot
- ▶ Black graduations
- ▶ Certified RNase-/DNase-free
- ▶ Vials have a silicone washer for a secure seal.
- ▶ Vials may be color coded with inserts (Cat. No. 430499)
- ▶ Self-standing vials have a special base design allowing them to be locked into cryogenic rack and tray (Cat. No. 430525 or 431131) for single-handed manipulation
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ Free foam rack with each case

### External Thread Cryogenic Vials Ordering Information

Cat. No.	Capacity (mL)	Style	Self-Standing	Qty/Pk	Qty/Cs
430658	1.2	Conical Bottom	Yes	50	500
430659	2.0	Round Bottom	Yes	50	500
430661	2.0	Round Bottom	No	50	500
430662	4.0	Round Bottom	Yes	50	500
430663	5.0	Round Bottom	Yes	50	500

**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.



External Thread Cryogenic Vials

### Cryogenic Vial Safety Tip

Appropriate safety equipment (gloves, face shields, biological safety cabinets, hoods, etc.) should always be used to protect personnel when removing vials or ampules from cryogenic storage systems.



Internal Thread Cryogenic Vials

### Internal Thread Cryogenic Vials

- ▶ Manufactured from polypropylene to withstand temperatures down to -196°C
- ▶ Larger marking spot
- ▶ Black graduations
- ▶ Certified RNase-/DNase-free
- ▶ Vials have a silicone washer or rubber O-ring for a secure seal
- ▶ Vials may be color coded with inserts (Cat. No. 430499)
- ▶ Self-standing vials have a special base design allowing them to be locked into cryogenic rack and tray (Cat. No. 430525 or 431131) for single-handed manipulation
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ Free foam rack with each case

### Internal Thread Cryogenic Vials Ordering Information

Cat. No.	Capacity (mL)	Style	Self-Standing	Seal Type	Qty/Pk	Qty/Cs
430487	1.2	Conical Bottom	Yes	Washer	50	500
2012	1.2	Conical Bottom	Yes	O-Ring	50	250
430488	2.0	Round Bottom	Yes	Washer	50	500
430489	2.0	Round Bottom	No	Washer	50	500
2027	2.0	Round Bottom	No	O-Ring	50	250
2028	2.0	Round Bottom	Yes	O-Ring	50	250
430490	4.0	Round Bottom	No	Washer	50	500
430491	4.0	Round Bottom	Yes	Washer	50	500
430492	5.0	Round Bottom	No	Washer	50	500
430656	5.0	Round Bottom	Yes	Washer	50	500
2051	5.0	Round Bottom	No	O-Ring	50	250

**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.

### External Thread Cryogenic Vials with Plug Seal Cap

- ▶ Manufactured from polypropylene to withstand temperatures down to -196°C
- ▶ Vials feature an external thread with a traditional plug seal cap design for a secure seal
- ▶ Cap does not accept color-coded inserts
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

### External Thread Cryogenic Vials with Plug Seal Cap Ordering Information

Cat. No.	Capacity (mL)	Style	Self-Standing	Qty/Pk	Qty/Cs
430289	2.0	Round Bottom	No	50	500

**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.



430289 External Thread Cryogenic Vials with Plug Seal Cap



430499 Color-Coded Cap Inserts

### Cap Inserts for Cryogenic Vials

- ▶ Caps inserts provide color coding for easy sample identification
- ▶ Inserts are packaged in resealable bags
- ▶ Nonsterile
- ▶ Cap inserts fit all Corning® cryogenic vials except Cat. No. 430289

#### Cryogenic Vials Cap Inserts Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
430499	Assorted colors, polypropylene cap inserts: 100 each of white, blue, red, green, and yellow	50	500
2015	White polypropylene cap inserts	50	500
2016	Blue polypropylene cap inserts	50	500
2017	Red polypropylene cap inserts	50	500
2018	Green polypropylene cap inserts	50	500
2019	Yellow polypropylene cap inserts	50	500

### Cryogenic Vial Racks and Storage Boxes

- ▶ Reusable racks are designed for use with most cryogenic vials
- ▶ Cat. No. 430525 has a locking feature for use with all Corning self-standing vials

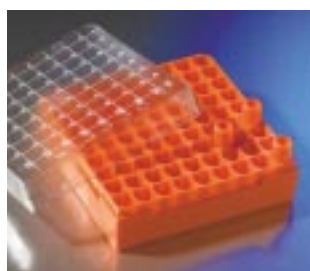


430525 and 431131  
Cryogenic Vial Racks

#### Cryogenic Vial Racks and Storage Boxes Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
430525	Polycarbonate rack and tray, holds 30 vials; self-locking design in ice/water bath	1	1
430526	Polycarbonate rack only, holds 30 vials; self-locking design	1	1
431131	Reusable orange polypropylene vial rack, holds 50 vials; self-locking design	2	2
431119	81 count (9 x 9 array) Cryogenic Box, for 1-2 mL vials	5	10
431120	81 count (9 x 9 array) Cryogenic Box, for 4-5 mL vials	5	10
431121*	100 count (10 x 10 array) Cryogenic Box, for 1-2 mL vials	5	10

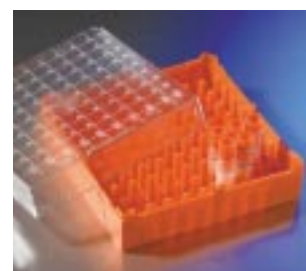
\*431121 accepts internally threaded cryogenic vials only.



431119 Cryogenic Storage Box



431120 Cryogenic Storage Box



431121 Cryogenic Storage Box

## Centrifuge Tubes



15 mL Centrifuge Tube

### 15 mL Centrifuge Tubes

- ▶ Corning® 15 mL centrifuge tubes feature black printed graduations and a large white marking spot.
- ▶ Tubes are available with your choice of cap styles; the original plug seal or flat cap.
- ▶ Tubes are available in racks or bulk packed in ziplock, resealable sleeves
- ▶ Sterile, certified nonpyrogenic, and RNase-/DNase-free
- ▶ Foam racks also available separately

#### Centrifuge Tubes Ordering Information

Cat. No.	Material	Cap Style	Max. RCF	Qty/Pk	Qty/Cs
430053	PET	Plug Seal	3,600	25/Sleeve	500
430055	PET	Plug Seal	3,600	50/Rack	500
430052	PP	Plug Seal	8,400	50/Rack	500
430766	PP	Plug Seal	8,400	25/Sleeve	500
430790	PP	Flat Top	8,400	50/Rack	500
430791	PP	Flat Top	8,400	25/Sleeve	500
431355	Foam Centrifuge Tube Rack, 15 mL				20

PP = Polypropylene, PET = Polyethylene Terephthalate, RCF = Relative Centrifugal Force (x g).

### 50 mL Centrifuge Tubes

- ▶ Corning® 50 mL centrifuge tubes feature black printed graduations and a large white marking spot
- ▶ These tubes are available with your choice of cap styles; the original plug seal or flat cap
- ▶ Tubes are available in racks or bulk packed in ziplock, resealable sleeves
- ▶ Sterile, certified nonpyrogenic, and RNase-/DNase-free
- ▶ Foam racks also available separately

#### 50 mL Centrifuge Tubes Ordering Information

Cat. No.	Material	Cap Style	Max. RCF	Qty/Pk	Qty/Cs
430290	PP	Plug Seal	9,400	25/Rack	500
430291	PP	Plug Seal	9,400	25/Sleeve	500
430304	PET	Plug Seal	3,600	25/Rack	500
430828	PP	Flat Top	9,400	25/Rack	500
430829	PP	Flat Top	9,400	25/Sleeve	500
4558	PP	CentriStar™ Cap	15,500	25/Universal Rack*	300
4365	Foam Centrifuge Tube Rack, 50 mL			–	20

PP = Polypropylene, PET = Polyethylene Terephthalate, RCF = Relative Centrifugal Force (x g).

\*New innovative universal rack can hold 50 mL and 15 mL tubes securely, allowing researchers to work with and store both size tubes in the same rack, saving bench and storage space.



50 mL Centrifuge Tube





Self Standing 50 mL Centrifuge Tube

### Self-Standing 50 mL Centrifuge Tubes

- ▶ All Corning® 50 mL centrifuge tubes feature black printed graduations and a large white marking spot.
- ▶ Available with your choice of cap styles; the original plug seal or flat cap.
- ▶ Tubes are bulk packed in ziplock, resealable sleeves
- ▶ Sterile, certified nonpyrogenic, and RNase-/DNase-free.

#### Self-Standing 50 mL Centrifuge Tubes Ordering Information

Cat. No.	Material	Cap Style	Max. RCF	Qty/Pk	Qty/Cs
430897	PP	Plug Seal	3,000	25	500
430921	PP	Flat Top	3,000	25	500

PP = Polypropylene, RCF = Relative Centrifugal Force (x g).

### 250 mL and 500 mL Centrifuge Tubes and Support Cushions

- ▶ Corning 250 mL and 500 mL polypropylene tubes are ideal for applications requiring large-volume centrifugation.
- ▶ Each case of tubes contains a rack to facilitate handling.
- ▶ Support cushions must be used with this product unless the rotor has appropriately shaped V-bottom holders.
- ▶ Tubes are sterile and certified nonpyrogenic.

#### 250 mL and 500 mL Centrifuge Tubes Ordering Information

Cat. No.	Description	Material	Cap Style	Max RCF	Qty/Pk	Qty/Cs
430776	250 mL Tube	PP	Plug	6000	6	102
430236	250 mL Support Cushion	PEI	n/a	n/a	n/a	6
431123	500 mL Tube	PP	Plug	6000	6	36
431124	500 mL Support Cushion	PEI	n/a	n/a	n/a	6

PP = Polypropylene, PEI = Polyetherimide, RCF = Relative Centrifugal Force (x g).



500 and 250 mL Centrifuge Tubes

# Technical Appendix

## CHARACTERISTICS OF CORNING PLASTICWARE

		Polystyrene	Polyethylene (High Density)	Polypropylene	Polycarbonate	Nylon	P.T.F.E. (Teflon®)
<b>Physical Characteristics</b>	Basic Properties	Biologically inert, hard, excellent optical qualities	Biologically inert, high chemical resistance	Biologically inert, high chemical resistance, exceptional toughness	Clear, very tough, inert, high temperature resistance	Tough, heat resistant, machinable, high moisture vapor transmission	Biologically and chemically inert, high resistant slippery surface
	Clarity	Clear	Opaque	Translucent	Clear	Opaque	Opaque
	Autoclave Results	Melts	May distort	Withstands several cycles	Withstands one cycle	OK	OK
	Heat Distortion Point	147-175°F 64-80°C	250°F 121°C	275°F 135°C	280-290°F 138-143°C	300-356°F 150-180°C	250°F 121°C
	Burning Rate	Slow	Slow	Slow	Self-extinguishing	Self-extinguishing	None
<b>Effects of Laboratory Reagents</b>	Weak Acids	None	None	None	None	None	None
	Strong Acids	Oxidizing acids attack	Oxidizing acids attack	Oxidizing acids attack	May be attacked	Attacked	None
	Weak Alkalies	None	None	None	None	None	None
	Strong Alkalies	None	None	None	Slowly attacked	None	None
	Organic Solvents	Soluble in aromatic chlorinated hydrocarbons	Resistant below 80°C	Resistant below 80°C	Soluble in chlorinated hydrocarbons; partly soluble in aromatics	Resistant	Resistant
<b>Gas Permeability of Thin Wall Products*</b>	O <sub>2</sub>	Low	High	High	Very low	Very low	–
	N <sub>2</sub>	Very low	Low	Low	Very low	Very low	–
	CO <sub>2</sub>	High	Very high	Very high	Low	–	–

Portions of this table courtesy of Modern Plastics Encyclopedia. Most data are from tests by A.S.T.M. methods. Tables show averages or ranges. Many properties vary with manufacturer, formulation, testing laboratory, and the specific operating conditions.

\*Obtained from a table which lists gas permeability in CC/100 sq. inches per 24 hrs./mil.

## CHEMICAL COMPATIBILITY OF CORNING® PLASTICWARE

	PS	PP	PVC	CA	PC	CN	NY	MCE	PTFE	PET
<i>Acids</i>										
Hydrochloric acid (25%)	G	G	G	N	R	R	N	O	R	R
Hydrochloric acid (concentrated)	F	G	F	N	R	N	N	N	R	O
Nitric acid (concentrated)	P	P	P	N	R	N	N	N	O	N
Nitric acid (25%)	P	G	F	N	R	L	N	O	R	R
<i>Alcohols</i>										
Butanol	G	G	G	R	R	R	R	R	R	R
Ethanol	G	G	G	R	R	N	R	O	R	R
Methanol	G	G	G	R	R	N	R	O	R	R
<i>Aniline</i>										
Aniline	G	G	P	N	N	R	R	N	R	O
Dimethylformamide	P	G	F	N	N	N	R	N	R	N
<i>Bases</i>										
Ammonium hydroxide (25%)	F	G	G	R	N	R	R	O	N	O
Ammonium hydroxide (1N)	F	G	G	N	N	R	R	O	N	N
Sodium hydroxide	G	G	G	N	N	N	R	N	R	N
<i>Hydrocarbons</i>										
Hexane	P	G	F	R	R	R	R	R	R	R
Toluene	P	G	P	R	O	R	R	R	R	N
Xylene	P	F	P	R	R	R	R	R	R	N
Dioxane	P	G	P	N	N	N	R	N	R	R
Dimethylsulfoxide (DMSO)	P	G	P	N	N	N	R	N	R	O*
<i>Halogenated Hydrocarbons</i>										
Chloroform	P	G	P	N	N	R	R	N	R	R
Methylene chloride	P	F	P	N	N	R	R	N	R	N
<i>Ketones</i>										
Acetone	P	G	P	N	O	N	R	N	R	R
Methyl ethyl diketone	P	G	P	N	O	N	R	O	R	R

\*Can be used with aqueous solutions containing up to 20% DMSO.

R = Recommended, L = Limited Resistance, N = Not Recommended, O = Testing Advised, F = Fair, G = Good, P = Poor, PP = Polypropylene, PVC = Polyvinyl Chloride, CA = Cellulose Acetate, PC = Polycarbonate, PTFE = Polytetrafluoroethylene PS = Polystyrene, CN = Cellulose Nitrate, NY = Nylon, MCE = Mixed Cellulose Esters, PET = Polyethylene Terephthalate.

## CHARACTERISTICS OF CORNING CENTRIFUGE TUBES

The following information is provided to serve as a general guideline for determining suitability of Corning centrifuge tubes for your applications. In addition, Corning recommends following the procedures outlined by the centrifuge manufacturer, as well as conducting a trial run to determine proper conditions before beginning any critical applications.

Corning centrifuge tubes are tested for leakage. They should not break or leak if used in a properly balanced rotor with suitable carriers, holders, and adapters that fully support the tubes when run in accordance with the guidelines in this section. These tubes are intended for one-time use only; reuse is not recommended as breakage or leakage may occur.

The recommended working temperature range for Corning centrifuge tubes is 0 to 40°C. The suitability of these tubes for storage below 0°C depends on both the solution and the

storage conditions. In general, the polypropylene and PET tubes are more resistant to stress at low temperatures than polystyrene. It is strongly recommended that a trial run be performed under actual conditions to test the suitability of the tubes for frozen storage.

### Suggestions for Safe Centrifugation

- Caution:** When centrifuging pathogenic organisms, clinical specimens known or suspected of being infectious, or any other potentially biohazardous materials, approved safety containment systems should be used. Contact your centrifuge manufacturer for appropriate accessories or recommendations.
- Read protocols and instruction manuals carefully. Do not confuse speed or revolutions per minute (RPM) with relative centrifugal force (RCF). Instructions for centrifuging a sample at a given RPM and time are incomplete unless the rotor or radius is specified. Protocols should always state the time and RCF value for centrifuging a sample.

- Proper balancing and distribution of the load in a centrifuge is critical for optimum performance and to prevent damage to the tubes or centrifuge. Opposing buckets or loads should always be balanced within the range specified by the manufacturer. Tubes should always be distributed in the buckets with respect to the center of rotation as well as the pivotal axis of the bucket. Failure to do this may prevent the bucket from achieving a horizontal position during the centrifugation run. Uneven separations or tube failure may result.

These centrifuge tubes are intended for use by persons knowledgeable in safe laboratory practices. Failure can result from surface damage, exceeding the specified RCF values, using unsuitable support systems, improper temperatures, or incompatible chemicals.

The RCF ratings for Corning® disposable centrifuge tubes have been established at room temperature using tubes filled

to nominal capacity with water and spun in a horizontal rotor centrifuge for 5 minutes. The centrifuge must be equipped with the recommended carriers, adapters, and cushions that fully support the tubes. If an angle head rotor is used or proper support is not provided, RCF values will be lower. Use of liquid other than water may also lower RCF values. Please consult your centrifuge specifications and the nomogram table (page 39) to determine speeds at which maximum RCF is achieved.

### Chemical Compatibility of Disposable Plastic Centrifuge Tubes

The mechanical strength, flexibility, color, weight and dimensional stability of all plastic centrifuge tubes are affected to varying degrees by the chemicals with which they come in contact. Specific operating conditions, especially temperature, RCF, rotor type, carrier design, and run length will also affect tube performance.

### Physical Properties of Disposable Plastic Centrifuge Tubes

	Clear Polypropylene	Opaque Polypropylene	New Polyethylene Terephthalate
Recommended Working Temp*	0-40°	0-40°	0-40°
Heat Distortion Point	121°	121°	70°
Flexibility	Moderate	Moderate	Rigid
Transparency	Clear	Opaque	Clear
Maximum RCF:			
15 mL Tube	8,400 x g	–	3,600 x g
50 mL Tube	9,400 x g	–	3,600 x g
250 mL Tube	–	6,000 x g	–
500 mL Tube	–	6,000 x g	–

\*At room temperature for 24 hours.

### Chemical Resistance of Disposable Plastic Centrifuge Tubes\*

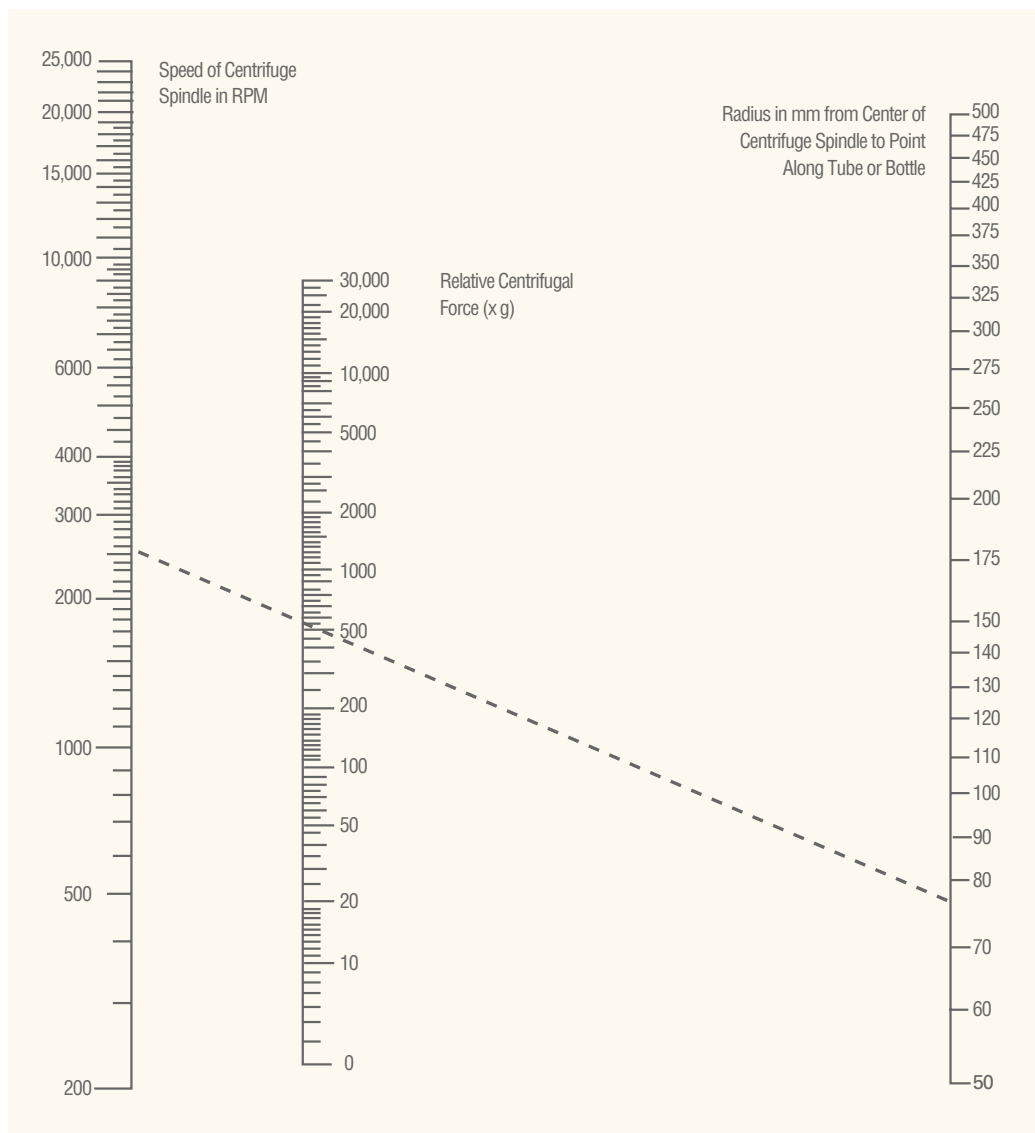
Chemical Class	Polyethylene Terephthalate	Polypropylene	Polyethylene Caps
Acids (weak)	1	1	1
Acids	3	1	1
Alcohols	1	1	1
Aldehydes	3 <sup>a</sup>	2 <sup>a</sup>	1
Bases	3	1	1
Esters	2	2	2
Hydrocarbons:			
Aliphatic	1	2	3
Aromatic	3	3 <sup>b</sup>	3
Halogenated	2	3	3
Ketones	2	2 <sup>c</sup>	2

\*At room temperature for 24 hours.

1 = Recommended; 2 = Suitable for most applications. However, a trial run under specific operating conditions is recommended; 3 = Not recommended.

Note: a = Formaldehyde, rated 1; b = Phenol, rated 1; c = Acetone, rated 1.

Nomogram for Computing Relative Centrifugal Force



To calculate the RCF value at any point along the tube or bottle, measure the radius, in mm, from the center of the centrifuge spindle to the particular point. Draw a line from the radius value on the right hand column to the appropriate centrifuge speed on the left-hand column. The RCF value is the point where the line crosses the center column. The nomogram is based on the formula:

$$RCF = (11.17 \times 10^{-7}) RN^2$$

where:

R = Radius in mm from centrifuge spindle to point in tube bottom

N = Speed of spindle in RPM

## CORNING® CELL CULTURE SURFACES

## Introduction

For over eighty years Corning has been developing products and surfaces for cell culture. Corning currently offers five polystyrene-based surfaces (Table 1) for growing cells including the most recent technology revolution, the patented Corning CellBIND® surface (U.S. Patent 6,617,152):

Most of these early plastic vessels were made from polystyrene, a long carbon chain polymer with benzene rings attached to every other carbon. Polystyrene was chosen because it has excellent optical clarity, is easy to mold and is relatively inexpensive. However, it also has one significant drawback: it is a very hydrophobic (nonwetable) polymer to which cells have difficulty attaching. Fortunately, the surface of polystyrene can be easily modified by a variety of chemical (sulfuric acid) and physical (corona discharge, gas-plasma or irradiation) methods). Using these methods, hydroxyl, ketone, aldehyde, carboxyl and amine groups can readily be grafted onto the polymer (Figure 1). These groups modify the surface characteristics changing the uncharged hydrophobic surface into a more ionic hydrophilic surface. Polystyrene can also be modified through chemical reactions to allow the covalent attachment of a variety of reactive groups that can be used for the subsequent covalent immobilization of biomolecules. For additional information, please check the References.

## Untreated Polystyrene Surface

Natural, unmodified polystyrene surfaces are hydrophobic and only bind cells and biomolecules through passive hydrophobic interactions. Corning offers untreated polystyrene culture dishes and microplates for growing cells in stationary suspension or other applications where reduced cell attachment is desired. However, these untreated vessels are sterilized by low dose gamma irradiation, which slightly increases the wettability of the surface. Since some transformed cell lines (CHO-k1, for example) and macrophages will attach and grow on these hydrophobic surfaces, Corning also offers an Ultra Low Attachment Surface (see below) for use in situations where cell attachment must be kept to an absolute minimum.

Table 1. Corning Cell Culture Surfaces

Corning Surface	Binding Interaction	Sample Properties
Untreated polystyrene	Hydrophobic	Significantly reduces the attachment of most cells
Ultra Low Attachment coated polystyrene	Hydrophilic and nonionic	Hydrogel layer prevents the attachment of almost all cells
Tissue culture treated polystyrene	Hydrophilic and ionic (negatively charged)	Allows cell attachment and binding to polystyrene
Corning CellBIND modified polystyrene surface	Hydrophilic and ionic (negatively charged)	Improves cell attachment and binding to polystyrene
Poly-D-lysine coated polystyrene	Hydrophilic and ionic (positively charged)	Improves cell attachment and binding to polystyrene

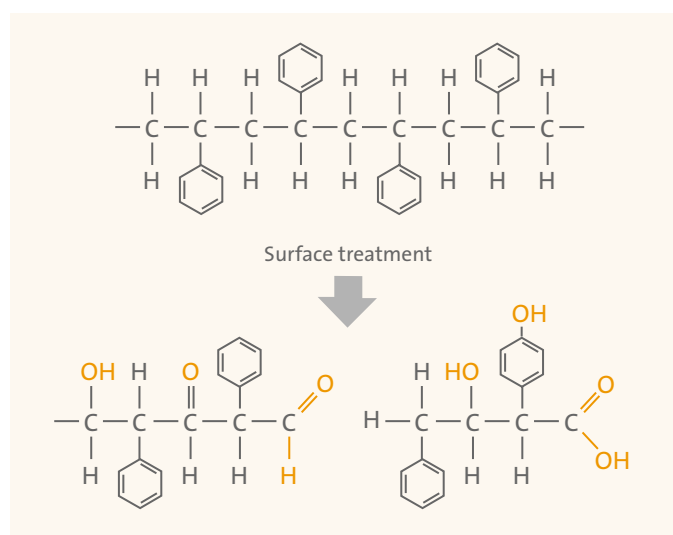


Figure 1. Polystyrene can be surface modified by the addition of a variety of different chemical groups, by breaking the carbon chain backbone, or by opening the benzene ring (not shown).

## Ultra Low Attachment Coated Polystyrene Surface

The Corning Ultra Low Attachment surface is a covalently bound hydrogel layer that is hydrophilic and neutrally charged. Since proteins and other biomolecules passively adsorb to polystyrene surfaces through either hydrophobic or ionic interactions, this hydrogel surface naturally inhibits nonspecific immobilization via these forces, thus inhibiting subsequent cell attachment. This surface is very stable, non-cytotoxic, biologically inert and nondegradable. Corning offers the Ultra Low Attachment surfaces on dishes and microplates.

This Ultra Low Attachment surface has been shown to successfully inhibit attachment of anchorage dependent MDCK, VERO, and C6 cells grown for a period of time equal to that necessary to obtain confluent cell growth on the control surface (standard tissue culture treated polystyrene; Figure 2). This surface has also been shown to inhibit the attachment and activation of macrophages and neutrophils.



Ultra Low Attachment culture vessels are useful for:

- ▶ Studying tissue-specific functions of certain cancer cells (i.e., MCF-7 breast cancer cells)
- ▶ Preventing stem cells from attachment-mediated differentiation
- ▶ Selectively culturing tumor or virally transformed cells as unattached colonies (substitute for soft agar assays)

### Standard Tissue Culture Treated Polystyrene Surface

Standard Corning® polystyrene cell culture vessels are surface modified using either corona discharge (flasks, dishes and microplates) or gas-plasma (roller bottles and culture tubes). These processes generate highly energetic oxygen ions which graft onto the surface polystyrene chains (Figure 1) so that the surface becomes hydrophilic and negatively charged when placed in medium. Corning offers the standard tissue culture treated surface on flasks, dishes, multiple well plates, CellSTACK® Culture Chambers, roller bottles and culture tubes.

### Corning CellBIND® Modified Polystyrene Surface

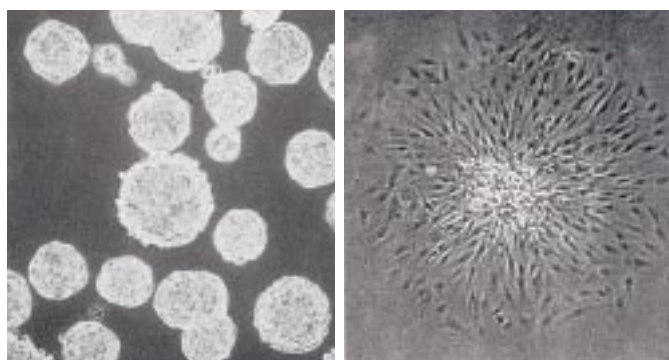
The Corning CellBIND culture surface, the first novel cell culture surface treatment in over 20 years, is designed to improve cell attachment under difficult conditions, such as reduced-serum or serum-free medium, resulting in higher cell yields. It is also useful for growing “difficult” cells, such as primary cultures or transfected cells over expressing proteins (Figure 3). Developed by Corning scientists, this patented technology (U.S. Patent 6,617,152) uses a novel microwave plasma process for treating the culture surface. This process improves cell surface than traditional plasma or corona discharge treatments, rendering it more hydrophilic (wetable) and increasing the stability of the surface.

Unlike biological coatings, the Corning CellBIND surface is a nonbiological surface that requires no special handling or storage. Because the polymer is treated, rather than coated, the surface is more consistent and stable. This enhanced cell performance has already led to a major biotechnology company choosing Corning roller bottles with the Corning CellBIND surface for producing a new FDA approved protein therapeutic.

Corning CellBIND surface benefits:

- ▶ Gives more consistent and even cell attachment for difficult to attach cell lines, especially transfected cells
- ▶ Quickly adapts cells to reduced serum or serum-free conditions
- ▶ Reduces premature cell detachment from confluent cultures especially in roller bottles and during cell-based assays
- ▶ May eliminate the need for tedious, time-consuming, expensive and low stability biological coatings
- ▶ Stable at room temperature, requires no refrigeration or special handling

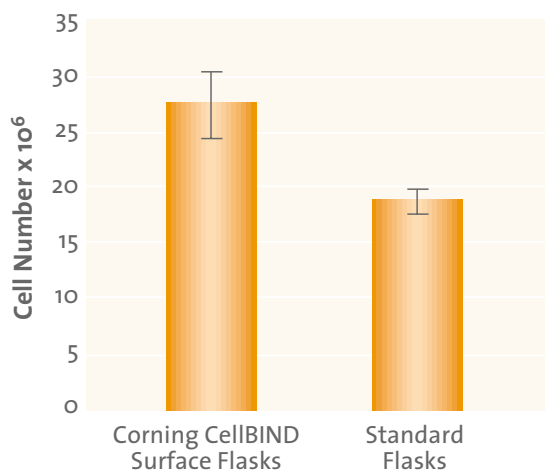
The Corning CellBIND surface is available on flasks, multiple well plates, CellSTACK Culture Chambers, roller bottles, 96 well plates, 384 well plates, and dishes.



**Figure 2.** Single cell derived colonies of C6 glioma cells grow as flattened attached colonies in standard tissue culture treated surface (left panel) but form unattached spherical colonies on the ultra low attachment surface (right panel).

### Poly-D-lysine Coated Surface

Some assays and procedures require enhanced binding of cells to polystyrene. Corning poly-D-lysine (PDL) microplates are coated with PDL (molecular weight range of 70 to 150 kDa) by a proprietary method. This synthetic polymeric coating creates a uniform net positive charge on the plastic surface which, for some cell types, can enhance cell attachment, growth and differentiation, especially in serum-free and low serum conditions. PDL surfaces often improve attachment and growth of primary neurons, glial cells, neuroblastomas, and a variety of transfected cell lines, including HEK-293. Corning offers poly-D-lysine coated 96 and 384 well microplates.



**Figure 3.** The first new cell culture treatment in over 20 years, the Corning CellBIND surface helps cells (such as the HEK-293 cells shown here) attach under difficult conditions and improves cell yields.



# Microplates

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## Overview

### DESIGNED FOR PERFORMANCE

Corning has been setting the standard for excellence in life science labware for over 85 years. With our comprehensive line of plasticware, including assay products, we continue to be an industry leader. Corning strives for the highest standards in product design and plastics molding.

Corning Life Sciences microplates and accessories are manufactured under strict process controls guaranteeing consistent product performance. Our manufacturing facility is located in Kennebunk, Maine, registered to the ISO 9001 2000 standards. ISO registration is recognized worldwide as a standard of excellence for quality systems.

Customers can request a Certificate of Compliance for any Corning® microplate. Also available are detailed product descriptions and drawings that highlight product dimensions and testing procedures. All are available by contacting your local Corning Life Sciences office. See the back cover of this guide for a listing.

### CORNING MICROPLATE EQUIPMENT COMPATIBILITY PROGRAM

The increasing use of automated laboratory equipment demands consumables that have been qualified for fit and function. Corning microplates are designed with automation compatibility in mind and meet industry standards. In addition, Corning has a comprehensive equipment compatibility program in which leading equipment manufacturers certify the compatibility of our microplates with their instruments.

For the most up-to-date information on equipment compatibility, Corning maintains a *Microplate Equipment Compatibility Guide* on our web site at [www.corning.com/lifesciences](http://www.corning.com/lifesciences). This on-line guide is searchable by instrument type, plate type, and by manufacturer name.

### LIFE SCIENCES EARLY ACCESS TO DEVELOPMENT – CORNING'S L.E.A.D. PROGRAM

Corning is committed to meeting the rapidly evolving needs of the life sciences laboratory. We are continually developing new and innovative products that are compatible with the latest advances in technology and instrumentation. Our L.E.A.D. program gives researchers access to these products and special pricing prior to their full market release. Contact your local Corning Life Sciences office or representative for more information about the products currently available through this program.

## SELECTING THE BEST CORNING® MICROPLATE FOR YOUR APPLICATION

Corning offers a range of microplates in a variety of well designs and sizes, polymer materials and colors, and surface treatments. This guide includes 96, 384, and 1536 well microplates. Information on Corning plates in lower density formats (e.g., 24 and 48 well plates) can be found in our on-line product catalog at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

There are three simple steps for selecting the best Corning microplate for your application:

- 1 Choose the Corning microplate format and well design
- 2 Choose the Corning microplate material and color
- 3 Choose the Corning surface treatment

### 1 Choose the Corning Microplate Format and Well Design

Corning microplate dimensions meet industry standards, ensuring compatibility with all microplate equipment and automation. Our microplates feature an A-1 corner notch design. The A-1 corner notch allows for quick visual orientation of plates when setting up automation runs, thereby reducing chances for robotics problems and lost productivity.

Corning microplates are available in several well shapes, optimized to meet different application requirements.

- **Flat bottom** – for bottom reading plate readers and cell culture applications
- **Round bottom** – for improved mixing and washing
- **V-bottom** – for easier removal of total well contents
- **Easy Wash™ bottom** (round to narrowed flat well bottom) – for improved washing in immunoassays

In addition, Corning offers Half Area microplates for the 96 well format and Low Volume microplates for the 384 well format. These microplates are ideal for assays using reduced working volumes and can provide savings in reagent and compound use.

#### Well Shape Selection Chart

Well Shape	Microplate Format						
	96 Well	96 Well Stripwell™	Half Area 96 Well	384 Well	Low Volume 384 Well	1536 Well	2 $\mu$ L 1536 Well
Flat bottom	■	■	■	■		■	
Round bottom	■				■	■	■
V-bottom	■						
Easy Wash bottom	■						

Detailed information about well volume, working volumes, and plate dimensions for Corning 96, 384, and 1536 well microplates are provided throughout this guide.

### 2 Choose the Corning Microplate Material and Color

Corning uses different polymers for microplates to support various application requirements. Selection of the appropriate polymer material and color can improve assay performance. Additional technical information on key polymers can be found in the appendix at the end of this guide.

#### Material Selection Chart

Plate Material	Microplate Format						
	96 Well	96 Well Stripwell	Half Area 96 Well	384 Well	Low Volume 384 Well	1536 Well	2 $\mu$ L 1536 Well
Clear polystyrene	■	■	■	■			■
Solid black or white polystyrene	■	■	■	■	■	■	■
Clear bottom black or white polystyrene	■		■	■	■	■	
Polypropylene	■			■			
Solid black or white polypropylene	■			■*			
Flexible vinyl (PVC)	■						
UV	■		■	■			

\*Only available in black polypropylene



Corning® microplates are available in different materials:

- ▶ **Clear polystyrene microplates** are used for cell culture and colorimetric (absorbance) assays.
- ▶ **Black and white polystyrene microplates** can be used for fluorescent and luminescent assays. Solid black polystyrene plates are designed to reduce well-to-well crosstalk and background for fluorescent assays. Solid white polystyrene plates are designed to reduce well-to-well crosstalk, enhance luminescent signals and reduce background for luminescent assays. Both black and white plates are available with clear bottoms for use in cell-based assays and microscopy applications, and allow top or bottom reading capabilities.
- ▶ **Polypropylene microplates** are ideal for compound storage or assays that require high resistance to solvents including DMSO and ethanol. The Corning ClearPro™ 96 well microplate is also available and has greater clarity than standard polypropylene for easier visual inspection of samples.
- ▶ **Black and white polypropylene microplates** can be used for fluorescent and luminescent assays and reduce nonspecific binding problems observed with polystyrene plates. The polypropylene material is also highly resistant to many commonly used solvents.
- ▶ **Flexible vinyl (PVC) microplates** are economical, nonsterile general assay 96 well plates. Due to their flexible nature, these microplates are not compatible with automation.
- ▶ **UV microplates** allow UV absorbance readings with low background especially at 260 to 280 nm, and are ideal for determining protein or nucleic acid concentration.

### 3 Choose the Corning Surface Treatment

Corning offers polystyrene microplates with a variety of modified surfaces. These surfaces can support binding or covalent immobilization of cells, proteins, nucleic acids, and other biomolecules. Additional information on these surfaces can be found in the Technical Appendix at the end of this guide.

#### Surface Treatment Selection Chart

Surface Treatment	Microplate Format						
	96 Well	96 Well Stripwell™	Half Area 96 Well	384 Well	Low Volume 384 Well	1536 Well	2 µL 1536 Well
<i>For General Assay</i>							
Not Treated (medium binding)	■	■	■	■	■	■	■
High Binding	■	■	■	■	■		■
Nonbinding (NBS™)	■		■	■	■	■	
Sulfhydryl (Sulfhydryl-BIND™) Binding	■	■					
Carbohydrate (Carbo-BIND™) Binding	■	■					
Photo-reactive (Universal-BIND™) Binding	■	■					
Amine Binding		■					
<i>For Cell Culture</i>							
Tissue Culture (TC) Treated	■	■	■	■	■	■	■
Ultra Low Attachment	■						
Corning® CellBIND® Surface	■			■			
Poly-D-Lysine	■			■			

Corning offers various surface treatments for microplates:

- ▶ **Not treated (or medium binding) polystyrene surface** is hydrophobic in nature and binds biomolecules through passive interactions. It is suitable primarily for the immobilization of large molecules, such as antibodies, that have large hydrophobic regions that can interact with the surface.
- ▶ **High binding surface** is capable of binding medium (>10 kD) and large biomolecules that possess ionic groups and/or hydrophobic regions.
- ▶ **Nonbinding NBS surface** is a Corning proprietary treatment technology used on polystyrene microplates to create a nonionic hydrophilic surface (polyethylene oxide-like) that minimizes molecular interactions. Ideal for reducing protein and nucleic acid binding at low concentrations, and increasing assay signal to noise.

- ▶ **Corning® CellBIND® Surface** treatment can provide improved consistency and even cell attachment.
- ▶ **Tissue culture treated (TC-Treated) surface** is used for the attachment and growth of anchorage-dependent cells.
- ▶ **Ultra Low Attachment surface** has a covalently bonded hydrogel designed to minimize cell attachment, protein absorption, enzyme activation and cellular activation. This surface is noncytotoxic, biologically inert and nondegradable.
- ▶ **Poly-D-lysine coated surface** can improve attachment of difficult-to-attach cells.
- ▶ **Sulfhydryl (Sulfhydryl-BIND™) binding surface** has covalently-linked maleimide groups that covalently couple to sulfhydryl groups via SH moieties. Ideal for assays requiring site-directed orientation of a biomolecule, especially antibodies.
- ▶ **Carbohydrate (Carbo-BIND™) binding surface** has hydrazide groups covalently coupled to carbohydrate groups. Ideal for assays requiring site-directed orientation of a biomolecule (oxidized antibodies, carbohydrates, and glycosylated proteins) while maintaining enzymatic or immunological activity.
- ▶ **Photo-reactive (Universal-BIND™) surface** covalently immobilizes biomolecules via abstractable hydrogens using UV illumination, resulting in a carbon-carbon bond. Although linkage is nonspecific and does not allow for site-directed orientation of a biomolecule, this surface may be useful for immobilization of double stranded DNA, antigens of unknown structure, and mixtures of biomolecules (e.g., cell lysates).
- ▶ **Amine surface** has positively charged amine groups ( $2 \times 10^{13}$  reactive sites/cm<sup>2</sup>) that can be used for covalent immobilization via bifunctional crosslinkers.

## BAR CODE CUSTOMIZATION

### What is a Bar Code\*?

The same kind of bar codes you see in stores and supermarkets can be very useful to your lab. Consisting of a series of black bars and light spaces representing letters and/or numerals, a bar code is an easy-to-use vehicle for data collection. The specific arrangement of these bars and spaces follows strict rules known as a “symbology.”

### How Does a Bar Code Work?

Bar codes reflect spots of light into a scanner in varying amounts. These differences in reflection are translated into electrical signals by a light detector inside the scanner. The signals are converted into binary ones and zeros, which are used in various combinations to stand for specific numbers and letters.

### Custom Designed Bar Codes

Corning will assist in designing and implementing a bar code label to meet your exact specifications. We will provide bar code label test samples at the front end of a project, to confirm decodability and ensure flawless performance in your end-use process. Our other customization features include:

- ▶ Flexible bar code and corresponding human readable layout/orientation on the bar code label, for compatibility with the internal bar code scanner inside your automated instruments
- ▶ Color coding
- ▶ Superior print quality and resolution
- ▶ Flexible bar code label positioning
- ▶ Resistant to most commonly used organic solvents

### Dependable Durability

Bar codes have been quality tested for optimal readability, chemical resistance, and temperature variation.

### Expert Advice

Most Corning® microplates are suitable for bar code customization. Contact Corning Life Sciences or your local representative for more information.

\*Information provided by Computype, Inc.



Bar Coded Microplates



## 96 Well Microplates

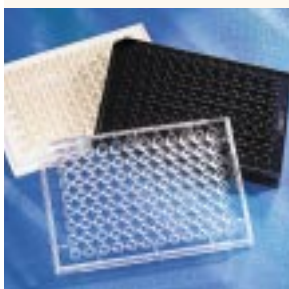
Corning offers a complete line of 96 well microplates for laboratory miniaturization and automation. These microplates are grouped by application into four key areas:

- 1 General assays** – Not treated, NBS™, covalent binding, high binding, flexible vinyl (PVC), and UV microplates
- 2 Cell culture and cell-based assays** – Tissue culture treated, Corning® CellBIND® Surface, poly-D-lysine, and Ultra Low Attachment polystyrene microplates
- 3 Immunoassays** – EIA/RIA and Stripwell™ polystyrene plates
- 4 Storage** – Polypropylene microplates and cluster tubes

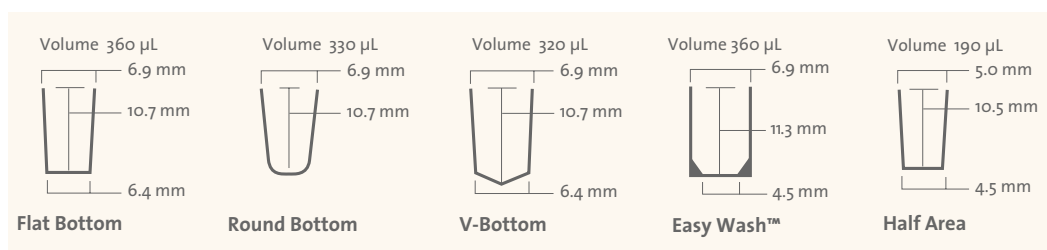
This selection guide does not include 96 well microplates for PCR and genomics. Please refer to the Corning Genomics Selection Guide or our web site ([www.corning.com/lifesciences](http://www.corning.com/lifesciences)) for additional information on these products.

### Tip for Reducing Reagent Use

Corning® 96 Well Half Area Microplates can save on valuable reagents by reducing the amount of reagent needed per well, while still retaining the ability to be read in standard plate readers. These microplates have a suggested working volume as low as 25 µL and are available untreated or with tissue culture, high bind, or NBS treatment.



### 96 Well Geometry and Dimensions



- ▶ Recommended working volume of 96 well standard plates is 75 to 200 µL.
- ▶ Recommended working volume of 96 well Half Area plates is 25 to 100 µL.
- ▶ Corning 96 well polystyrene microplates have plate dimensions (length x width x height) of 127.76 x 85.48 x 14.22 mm that meet proposed industry standards.

For additional microplate information, refer to *Selecting the Best Corning Microplate for Your Application* in the Overview section of this guide.

### 1 96 WELL GENERAL ASSAY MICROPLATES

Corning offers a wide variety of general assay microplates. They are organized into five groups:

- ▶ 96 Well Clear Polystyrene Microplates
- ▶ 96 Well Solid Black and White Polystyrene Microplates
- ▶ 96 Well Clear Bottom Black and White Polystyrene Microplates
- ▶ 96 Well Clear Flexible Vinyl (PVC) Microplates
- ▶ 96 Well UV Microplates

#### 96 Well Clear Polystyrene Microplates

- ▶ Standard well volumes: flat bottom – 360 µL; round bottom – 330 µL; V-bottom – 320 µL; recommended working volumes of 75 to 200 µL
- ▶ Half Area microplate has well volume of 190 µL; working volumes of 25 to 100 µL.
- ▶ Lids available where indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)



96 Well Clear Polystyrene Microplates

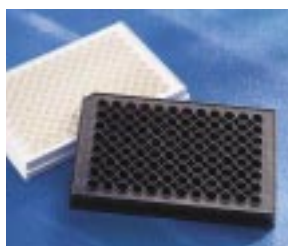
### 96 Well Clear Polystyrene Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
3367	Standard Plate	Round	Not Treated	Yes	1	50
3788	Standard Plate, with Lid	Round	Not Treated	Yes	20	100
3795	Standard Plate	Round	Not Treated	Yes	25	100
3798	Standard Plate	Round	Not Treated*	No	25	100
3896	Standard Plate	V	Not Treated	Yes	1	48
3897	Standard Plate	V	Not Treated	No	25	100
3898	Standard Plate	V	Not Treated*	No	25	100
3370	Standard Plate, with Lid	Flat	Not Treated	Yes	20	100
9017	Standard Plate	Flat	Not Treated	No	25	100
9018	Standard Plate	Flat	High Bind	No	25	100
3641	Standard Plate	Flat	NBS™	No	25	100
2507	Standard Plate	Flat	Carbo-BIND™	No	1	50
2509	Standard Plate	Flat	Sulphydryl-BIND™	No	1	50
2503	Standard Plate	Flat	Universal-BIND™	No	1	50
3690	Half Area Plate	Flat	High Bind	No	25	100
3695	Half Area Plate	Flat	Not Treated	No	25	100

\*Processed to improve hydrophilicity for hemagglutination and similar assays.

### 96 Well Solid Black and White Polystyrene Microplates

- Designed to reduce well-to-well crosstalk
- White plates enhance luminescent signals and have low background luminescence and fluorescence
- Black plates have low background fluorescence and minimize light scattering
- Standard well volumes: flat bottom - 360 µL; round bottom - 330 µL; recommended working volumes of 75 to 200 µL
- Half Area microplate has well volume of 190 µL; working volumes of 25 to 100 µL
- Lids available where indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)



96 Well Black and White Polystyrene Microplates

### 96 Well Solid Black and White Polystyrene Microplate Ordering Information

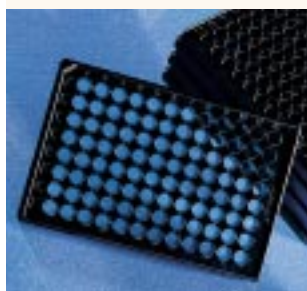
Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Black Polystyrene Microplates</i>						
3792	Standard Plate	Round	Not Treated	No	25	100
3915	Standard Plate	Flat	Not Treated	No	25	100
3925	Standard Plate	Flat	High Bind	No	25	100
3650	Standard Plate	Flat	NBS	No	25	100
3694	Half Area Plate	Flat	Not Treated	No	25	100
3686	Half Area Plate	Flat	NBS	No	25	100
<i>White Polystyrene Microplates</i>						
3789	Standard Plate	Round	Not Treated	No	25	100
3605	Standard Plate	Round	NBS	No	25	100
3912	Standard Plate	Flat	Not Treated	No	25	100
3922	Standard Plate	Flat	High Bind	No	25	100
3600	Standard Plate	Flat	NBS	No	25	100
3693	Half Area Plate	Flat	Not Treated	No	25	100

### NBS Binding Performance

Binding in ng/cm <sup>2</sup>	<sup>125</sup> I-IgG	<sup>125</sup> I-BSA	<sup>125</sup> I-Insulin	<sup>32</sup> P-oligo DNA	<sup>32</sup> P-λ phage DNA
Polystyrene	400	450	310	22	6
Polypropylene	380	440	370	3	<2
NBS on Polystyrene	<2.5	<2.5	5	<2	<2

### Tip for Improving Optical Performance in Fluorescent Assays

Corning® Special Optics 96 Well Microplates have black walls with ultra thin, clear bottoms for sharp, clear images and minimal background in fluorescent assays.



## 96 Well Clear Bottom Black and White Polystyrene Microplates

- Bottoms are 60% thinner than conventional polystyrene plates, resulting in lower background fluorescence and enabling readings down to 340 nm
- Opaque walls prevent well-to-well crosstalk
- Optically clear flat bottom permits direct microscopic viewing
- Can be used for both top and bottom reading instruments
- Standard well volume: flat bottom – 360 µL; recommended working volumes of 75 to 200 µL
- Half Area microplate has well volume of 205 µL; working volumes of 25 to 100 µL
- Lids available where indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)

### 96 Well Clear Bottom Black and White Polystyrene Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Black Clear Bottom Polystyrene Microplates</i>						
3615	Special Optics Plate, with Lid	Flat	Not Treated	No	25	100
3631	Standard Plate	Flat	Not Treated	No	25	100
3601	Standard Plate	Flat	High Bind	No	25	100
3651	Standard Plate	Flat	NBS™	No	25	100
3880	Half Area Plate	Flat	Not Treated	No	25	100
3881	Half Area Plate	Flat	NBS	No	25	100
<i>White Clear Bottom Polystyrene Microplates</i>						
3604	Standard Plate	Flat	NBS	No	25	100
3632	Standard Plate	Flat	Not Treated	No	25	100
3883	Half Area Plate	Flat	Not Treated	No	25	100
3884	Half Area Plate	Flat	NBS	No	25	100

## 96 Well Clear Flexible Vinyl (PVC) Microplates

- PVC microplates are very economical untreated plates for solution-based assays, serial dilutions, and general storage applications.
- Well volume of 250 µL (260 µL for V-bottom); working well volumes of 50 to 150 µL
- Lids are not available. (Information on lids and other microplate accessories can be found beginning on page 64.)

### 96 Well Clear Flexible PVC Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Sterile	Qty/Pk	Qty/Cs
2897	Standard Plate	V	No	25	100
2797	Standard Plate	Round	No	25	100
2595	Standard Plate	Flat	No	25	100

## 96 Well UV Microplates

The Corning 96 well UV microplate has a UV-transparent well bottom and is ideal for determining protein and/or nucleic acid concentrations.

- Certified DNase- and RNase-free
- UV-transparent bottom is molded directly to an acrylic base for greater strength and maximum leak resistance
- Standard well volume: flat bottom – 360 µL; recommended working volumes of 75 to 200 µL
- Half Area microplate has well volume of 205 µL; working volumes of 25 to 100 µL
- Allows UV absorbance readings with low background, especially at 260 to 280 nm
- Lids are available separately. (Information on lids and other microplate accessories can be found beginning on page 64.)



96 Well UV Microplate – Certified DNase- and RNase-free

### 96 Well UV Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Sterile	Qty/Pk	Qty/Cs
3635	Standard Plate	Flat	No	25	50
3679	Half Area Plate	Flat	No	25	50

## 2 96 WELL CELL CULTURE MICROPLATES

Corning® tissue culture treated microplates have the same surface treatment used on other Corning culture vessels. In addition to this traditional surface, Corning offers three additional surfaces: Corning CellBIND® Surface treatment for improving consistency and even cell attachment, a poly-D-lysine coating for enhancing attachment of difficult-to-attach cell lines, and an Ultra Low Attachment surface for minimizing cell attachment.

This section is organized into three groups:

- ▶ 96 Well Clear Polystyrene Cell Culture Microplates
- ▶ 96 Well Solid Black and White Polystyrene Cell Culture Microplates
- ▶ 96 Well Clear Bottom Black and White Polystyrene Cell Culture Microplates

### 96 Well Clear Polystyrene Cell Culture Microplates

- ▶ Standard well volumes: flat bottom – 360 µL; round bottom – 330 µL; V-bottom – 320 µL; recommended working volumes of 75 to 200 µL
- ▶ Half Area microplate has well volume of 190 µL; working volumes of 25 to 100 µL
- ▶ Sterilized by gamma radiation and certified nonpyrogenic
- ▶ Most plates have lids (Information on lids and other microplate accessories can be found beginning on page 64.)



96 Well Clear Tissue Culture Treated Microplates

### 96 Well Clear Cell Culture Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
3360	Standard Plate, no Lid	Round	TC-Treated	Yes	25	100
3799	Standard Plate, with Lid	Round	TC-Treated	Yes	1	50
3894	Standard Plate, with Lid	V	TC-Treated	Yes	1	50
3628	Standard Plate, with Lid	Flat	TC-Treated	Yes	20	100
3596	Standard Plate, with Lid	Flat	TC-Treated	Yes	1	50
3997	Standard Plate, with Lid	Flat	TC-Treated	Yes	10	50
3598	Standard Plate, with Lid	Flat	TC-Treated	Yes	5	100
3599	Standard Plate, with Lid	Flat	TC-Treated	Yes	1	100
3585	Standard Plate, with Lid*	Flat	TC-Treated	Yes	5	50
3595	Standard Plate, with Lid*	Flat	TC-Treated	Yes	1	50
9102	8-Well Strip Plate, with Lid	Flat	TC-Treated	Yes	1	50
3665	Standard Plate, with Lid	Flat	Poly-D-Lysine	Yes**	25	100
<b>New</b> 3300	Standard Plate, with Lid	Flat	Corning CellBIND Surface	Yes	5	50
3474	Standard Plate, with Lid	Flat	Ultra Low Attachment	Yes	1	24
3696	Half Area Plate, with Lid	Flat	TC-Treated	Yes	1	50
3697	Half Area Plate, with Lid	Flat	TC-Treated	Yes	20	100

\*Special low evaporation lid

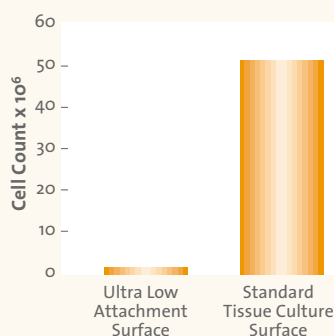
\*\*Aseptically manufactured

#### Corning Cell Culture Products are Certified Nonpyrogenic

All cell culture products are certified nonpyrogenic with documented endotoxin levels of less than 0.5 EU/mL. Corning offers a detailed technical bulletin on the effects of endotoxins in cell culture, plus a complete cell culture product listing at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).



**Corning® Ultra Low Attachment Microplate** (Cat. No. 3474) has a covalently bonded hydrogel layer to minimize cell attachment, protein absorption, enzyme activation and cellular activation. The surface is noncytotoxic, biologically inert, and nondegradable.



**Comparison of Cell Attachment in Ultra Low vs. Standard Tissue Culture Treated Plates**

Vero cells plated at  $2.6 \times 10^6$  cells per well grown for 4 days at 37°C in a 5% CO<sub>2</sub> environment show a 99% reduction in cellular attachment vs. standard culture treated product.

**96 Well Solid Black and White Cell Culture Microplates**



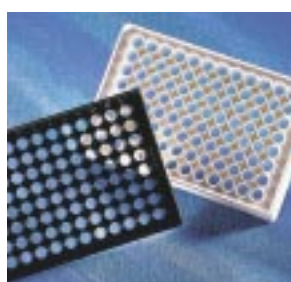
96 Well Black and White Tissue Culture Treated Microplates

- ▶ White walled plates enhance luminescent signals and have low background luminescence and fluorescence
- ▶ Black walled plates have low background fluorescence and minimal light scatter
- ▶ Standard well volume: flat bottom – 360 µL; recommended working volumes of 75 to 200 µL
- ▶ Half Area microplate has well volume of 190 µL; working volumes of 25 to 100 µL
- ▶ Sterilized by gamma radiation and certified nonpyrogenic
- ▶ Lids available where indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)

**96 Well Solid Black and White Cell Culture Microplate Ordering Information**

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Black Cell Culture Microplates</i>						
3916	Standard Plate, with Lid	Flat	TC-Treated	Yes	20	100
3875	Half Area Plate, with Lid	Flat	TC-Treated	Yes	20	100
<i>White Cell Culture Microplates</i>						
3917	Standard Plate, with Lid	Flat	TC-Treated	Yes	20	100
3362	Standard Plate, no Lid	Flat	TC-Treated	Yes	25	100
3688	Half Area Plate, with Lid	Flat	TC-Treated	Yes	25	100

**96 Well Clear Bottom Black and White Cell Culture Microplates**



96 Well Clear Bottom Black and White Microplates

- ▶ Bottoms are 60% thinner than conventional polystyrene plates, resulting in lower background fluorescence and enabling readings down to 340 nm.
- ▶ Opaque walls to prevent well-to-well crosstalk
- ▶ Optically clear flat well bottom permits direct microscopic viewing
- ▶ Can be used for both top and bottom reading instruments
- ▶ Standard well volume: flat bottom – 360 µL; recommended working volumes of 75 to 200 µL
- ▶ Half Area microplate has well volume of 205 µL; working volumes of 25 to 100 µL
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ Lids available where indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)



## 96 Well Clear Bottom Black and White Cell Culture Microplate Ordering Information

**Corning® CellBIND® Surface**

- Available in 96 and 384 well black clear bottom plate formats
- Surface treatment improves consistency and even cell attachment
- May improve attachment of many difficult-to-attach cell lines
- Not a coating, requires no special handling, and is stable at room temperature
- Sterilized by gamma radiation and certified nonpyrogenic

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Black Clear Bottom Cell Culture Microplates</i>						
3603	Standard Plate, with Lid	Flat	TC-Treated	Yes	1	48
3904	Standard Plate, with Lid	Flat	TC-Treated	Yes	20	100
3614	Special Optics Plate, no Lid	Flat	TC-Treated	Yes	25	100
<b>New</b> 3340	Standard Plate, with Lid	Flat	Corning CellBIND Surface	Yes	5	50
3667	Standard Plate, with Lid	Flat	Poly-D-Lysine	Yes*	25	100
3887	Half Area Plate, no Lid	Flat	TC-Treated	Yes	25	100
3882	Half Area Plate, with Lid	Flat	TC-Treated	Yes	20	100
<i>White Clear Bottom Cell Culture Microplates</i>						
3610	Standard Plate, with Lid	Flat	TC-Treated	Yes	1	48
3903	Standard Plate, with Lid	Flat	TC-Treated	Yes	20	100
3666	Standard Plate, with Lid	Flat	Poly-D-Lysine	Yes*	25	100
3886	Half Area Plate, no Lid	Flat	TC-Treated	Yes	25	100
3885	Half Area Plate, with Lid	Flat	TC-Treated	Yes	20	100

\*Aseptically manufactured

**3 96 WELL IMMUNOASSAY MICROPLATES**

Corning offers 96 well EIA/RIA plates and Stripwell™ plates manufactured from a special medical grade polystyrene for uniform binding, high optical clarity, and low background absorption.

**High Binding Plate Certification**

Certification Standards	High Binding	Medium Binding (Not Treated)
Well-to-well coefficient of variation (CV)	≤3%	≤5%
Average high and low wells from the mean	≤8%	≤15%
Background absorbance units from the mean	±0.005	±0.005

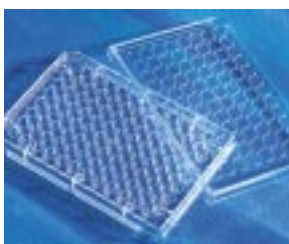
Corning® High Binding plates have a binding capacity of approximately 500 ng of Mouse IgG/cm<sup>2</sup>. The nontreated plates have a binding capacity of approximately 250 ng of Mouse IgG/cm<sup>2</sup>. Corning tests its EIA/RIA plates on a lot-to-lot basis and the certification results for each lot are made available upon request by contacting your local Corning Life Sciences office. In addition, five ELISA Technical Bulletins are available at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

**96 Well EIA/RIA Clear Polystyrene Microplates**

- Standard well volumes: flat bottom – 360 µL; round bottom – 330 µL; Easy-Wash™ bottom – 360 µL; recommended working volumes of 75 to 200 µL
- Lids available where indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)

**96 Well EIA/RIA Clear Polystyrene Microplate Ordering Information**

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
3797	Standard Plate	Round	Not Treated	No	25	100
3366	Standard Plate	Round	High Bind	No	25	100
3368	Standard Plate	Easy Wash	Not Treated	No	25	100
3369	Standard Plate	Easy Wash	High Bind	No	25	100
3591	Standard Plate	Flat	Not Treated	No	1	50
9017	Standard Plate	Flat	Not Treated	No	25	100
3361	Standard Plate, with Lid	Flat	High Bind	Yes	20	100
3590	Standard Plate	Flat	High Bind	No	1	100
9018	Standard Plate	Flat	High Bind	No	25	100

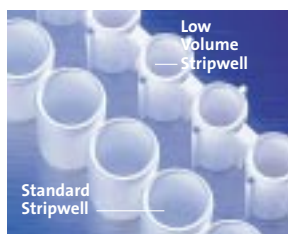


96 Well EIA/RIA Microplates





Stripwell Microplates



Standard vs. Low Volume

**Stripwell Low Volume Microplates**

**Big Cost Savings!**

- ▶ Save 70% or more on antibody costs
- ▶ Save 50% or more on reagent costs

**Features**

- ▶ Total well volume: 190 µL
- ▶ Recommended working volume: 75 to 125 µL
- ▶ Same height/path length as a standard strip
- ▶ Standard 96 well center-to-center spacing

**Custom Stripwell Microplate Colors**



**96 Well Polystyrene Stripwell™ Microplates**

Corning® Stripwell plates are designed for *in vitro* diagnostic assays. The flat bottom strips are designed to easily break apart and are pre-assembled in an “egg-crate” style strip holder that allows each individual well to be positioned back into the plate once broken.

- ▶ Stripwell plates have 96 well flat bottom polystyrene format
- ▶ Low volume and standard Stripwell microplates have well volumes of 190 µL and 360 µL, respectively
- ▶ 1 x 8 strips are designed to fit only one way into the strip holder, eliminating the chance of misorientation
- ▶ Accessories can be found beginning on page 64.

**Stripwell Microplates Ordering Information**

*Stripwell Low Volume Microplates*

Cat. No.	Color	Binding Property	Qty/Pk	Qty/Cs
2480	Clear	Medium	25	100
2481	Clear	High	25	100
2482	Black	Medium	25	100
2483	Black	High	25	100
2484	White	Medium	25	100
2485	White	High	25	100

*Standard Stripwell Microplates*

Cat. No.	Color	Binding Property	Qty/Pk	Qty/Cs
2592*	Clear	High	25	100
2593*	Clear	Medium	25	100
2580**	Clear	High	200	800
9102***	Clear	TC-Treated, Sterile	1	50
3913	White	Medium	25	100
3923	White	High	25	100
3914	Black	Medium	25	100
3924	Black	High	25	100

\*Product has a certified surface chemistry  
 \*\*Individual 1 x 8 Strips without frame, bulk packed  
 \*\*\*Microplates individually packaged with lid

*Surface Modified Stripwell Microplates, Clear*

Cat. No.	Description	Surface Chemistry	Well Volume	Qty/Pk	Qty/Cs
2388	Amine	Amine	360 µL	1	50
2504	Universal-BIND™ Surface	Universal	360 µL	1	50
2506	DNA-BIND™ Surface	N-oxysuccinimide	360 µL	1	50
2508	Carbo-BIND™ Surface	Hydrazide	360 µL	1	50
2510	Sulfhydryl-BIND™ Surface	Maleimide	360 µL	1	50

*Strip Accessories*

Cat. No.	Description	Sterile	Qty/Pk	Qty/Cs
2572	Strip Holder “egg crate”	No	5	20
2578	96 Well Strip Ejector	No	5	5

**Color Coding**

Corning offers customers the ability to color code their Stripwell microplates. Currently there are 14 colors available from which to choose on both our certified high and medium binding Stripwell plates. In addition to the clear strip, two other colors can be applied to the same plate. Color-coded Stripwell microplates are made to order and minimum order requirements do apply. If interested, please contact your local Corning representative.

## 4 96 WELL POLYPROPYLENE STORAGE MICROPLATES AND CLUSTER TUBES

### 96 Well Polypropylene Microplates and Storage Blocks

Corning polypropylene microplates offer both small volume and large volume (blocks) well formats to meet assay and storage requirements.

- ▶ Flat, round or V-shaped well bottom
- ▶ Feature uniform skirt heights for greater robotic gripping surface
- ▶ Solvent resistant polypropylene provides compatibility with many common organic solvents (e.g., DMSO, ethanol, methanol)
- ▶ Certified DNase- and RNase-free
- ▶ Available sterile or nonsterile
- ▶ Refer to the Microplate Accessories section for information about microplate accessory products including sealing tapes and mats.

### 96 Well Polypropylene Microplate Dimensions and Well Volumes

Well Shape	Total Well Volume (µL)	Well Depth (mm)	Well Diameter (mm)	Plate Dimensions (L x W x H) (mm)
96 Well Flat Bottom	360	10.67	6.86	127.76 x 85.48 x 14.22
96 Well Round Bottom	360	11.3	6.86	127.76 x 85.48 x 14.22
96 Well V-bottom	320	11.13	6.86	127.76 x 85.48 x 14.22
96 Well V-bottom, expanded volume	450	12.43	8.50	127.76 x 85.48 x 14.35
96 Well 0.5 mL Block	500	25.3	6.86	127.76 x 85.48 x 27.18
96 Well 1 mL Block	1000	39.9	6.86	127.76 x 85.09 x 41.66
96 Well 2 mL Block	2000	42.04	8.13 (width)	128.27 x 85.85 x 43.94



Corning ClearPro Microplate (Cat. No. 3371) has higher clarity than standard polypropylene plates and allows users to visually inspect their samples in each well.

### 96 Well Polypropylene Microplate Ordering Information

Cat. No.	Plate Format	Color	Well Bottom	Sterile	Qty/Pk	Qty/Cs
3357	Standard Plate	Clear	V	Yes	25	100
3363	Standard Plate	Clear	V	No	25	100
3364	Standard Plate	Clear	Flat	No	25	100
<b>New</b> 3344	Expanded Volume Plate	Clear	V	Yes	10	50
<b>New</b> 3343	Expanded Volume Plate	Clear	V	No	10	50
3359	Standard Plate	Clear	Round	Yes	25	100
3365	Standard Plate	Clear	Round	No	25	100
3371	Corning® ClearPro™ Plate	Clear	Round	No	25	100
3356	Standard Plate	Black	Round	No	25	100
3355	Standard Plate	White	Round	No	25	100

### 96 Well Polypropylene Storage Block Ordering Information

Cat. No.	Plate Format	Well Volume	Well Bottom	Sterile	Qty/Pk	Qty/Cs
3956	0.5 mL Round Well Block	0.5 mL	V	Yes	10	50
3957	0.5 mL Round Well Block	0.5 mL	V	No	100	100
3958	1 mL Round Well Block	1 mL	Round	Yes	5	25
3959	1 mL Round Well Block	1 mL	Round	No	5	100
3960	2 mL Square Well Block	2 mL	V	Yes	5	25
3961	2 mL Square Well Block	2 mL	V	No	5	100



96 Well Polypropylene Storage Blocks with Storage Mat



Cluster Tube Systems

### 96 Well Cluster Tubes

- ▶ Composed of 96 polypropylene tubes in a standard microplate format
- ▶ Feature 1.2 mL tubes that are available individually or in strips of eight tubes
- ▶ Polyethylene tube caps are available in 8-cap strips

#### 96 Well Cluster Tube Ordering Information

Cat. No.	Format	Sterile	Rack	Qty/Pk	Qty/Cs
4401	Individual	No	No	960/Bag	960
4408	8-Tube Strip	No	No	120/Bag	120
4410	Individual	No	Yes	96/Rack	960
4411	Individual	Yes	Yes	96/Rack	960
4412	8-Tube Strip	No	Yes	12/Rack	120
4413	8-Tube Strip	Yes	Yes	12/Rack	120
4418	8-Cap Strip	Yes	No	12/Bag	120

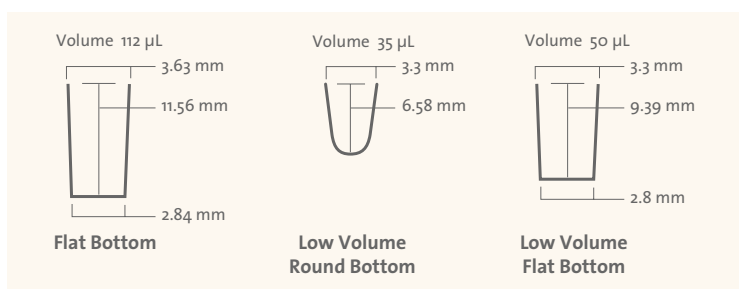
# 384 Well Microplates

Corning offers a variety of 384 well microplates for high throughput assays and storage. Microplates are grouped by application into three key areas:

- 1 General assays** – Not treated, NBS™, high binding, and UV microplates
- 2 Cell culture and cell-based assays** – Tissue culture treated, Corning® CellBIND® Surface, and poly-D-lysine coated polystyrene microplates
- 3 Storage** – Polypropylene microplates

This selection guide does not include 384 well microplates for PCR and genomics. Please refer to the Corning Genomics Selection Guide or web site ([www.corning.com/lifesciences](http://www.corning.com/lifesciences)) for additional information on these products.

## 384 Well Geometry and Dimensions



### Low Volume 384 Well Solid Black and White Microplates

Unique well design for optimal assay performance

- ▶ Raised well bottom for higher sensitivity
- ▶ Raised rim for decreased wicking and contamination
- ▶ Round bottom for better Z factor and minimized trapped air
- ▶ Conical well molded in the shape of a light cone for efficiency
- ▶ NBS surface treatment for improved signal/ noise ratio and reduced bubbles

- ▶ Recommended working volume of 384 well standard plates is 20 to 80 µL
- ▶ Recommended working volume of 384 well low volume solid plates is 5 to 20 µL. (5 to 15 µL with NBS treatment)
- ▶ Recommended working volume of 384 well low volume black clear bottom plates is up to 40 µL
- ▶ Corning 384 well polystyrene microplates have plate dimensions (length x width x height) of 127.76 x 85.48 x 14.22 mm that meet proposed industry standards

For additional microplate information, refer to *Selecting the Best Corning Microplate for Your Application* in the Overview section of this guide.

## 1 384 WELL GENERAL ASSAY MICROPLATES

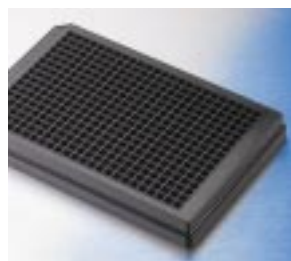
### 384 Well Clear Polystyrene Microplates

- ▶ Standard well volume of 112 µL; working well volumes of 20 to 80 µL
- ▶ Universal Optics NBS plate is manufactured using an advanced polymer with high clarity and improved chemical resistant properties
- ▶ Lids available as indicated. (Information on lids and other microplate accessories can be found beginning on page 64.)

### 384 Well Clear Polystyrene Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
3702	Standard Plate	Flat	Not Treated	No	25	100
3680	Standard Plate, with Lid	Flat	Not Treated	Yes	20	100
3640	Standard Plate	Flat	NBS	No	25	100
3700	Standard Plate	Flat	High Bind	No	25	100
3723	Universal Optics Plate (Standard)	Flat	NBS	No	25	100





384 Well Solid Black Microplates

### 384 Well Solid Black and White Polystyrene Microplates

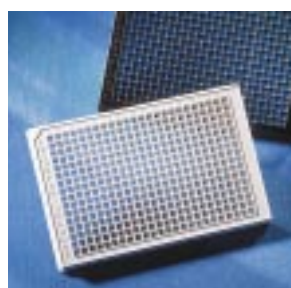
- ▶ Designed to reduce well-to-well crosstalk during fluorescent and luminescent assays
- ▶ Standard well volume of 112 µL; recommended working volumes of 20 to 80 µL
- ▶ Low Volume microplate has well volume of 35 µL; working volumes of 2 to 20 µL
- ▶ Lids are available separately. (Information on lids and other microplate accessories can be found beginning on page 64.)

#### 384 Well Solid Black and White Polystyrene Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Black Polystyrene Microplates</i>						
3710	Standard Plate	Flat	Not Treated	No	25	100
3654	Standard Plate	Flat	NBS™	No	25	100
3708	Standard Plate	Flat	High Bind	No	25	100
3677	Low Volume Plate	Round	Not Treated	No	25	100
3676	Low Volume Plate	Round	NBS	No	25	100
3678	Low Volume Plate	Round	High Bind	No	25	100
<i>White Polystyrene Microplates</i>						
3705	Standard Plate	Flat	Not Treated	No	25	100
3652	Standard Plate	Flat	NBS	No	25	100
3703	Standard Plate	Flat	High Bind	No	25	100
3674	Low Volume Plate	Round	Not Treated	No	25	100
3673	Low Volume Plate	Round	NBS	No	25	100

### 384 Well Clear Bottom Black and White Polystyrene Microplates

- ▶ Suited for fluorescent and luminescent assays using either top or bottom detection plate readers
- ▶ Standard well volume of 112 µL; recommended working volumes of 20 to 80 µL
- ▶ Low volume plate has well volume of 50 µL; working volume of up to 40 µL
- ▶ Lids are available separately. (Information on lids and other microplate accessories can be found beginning on page 64.)

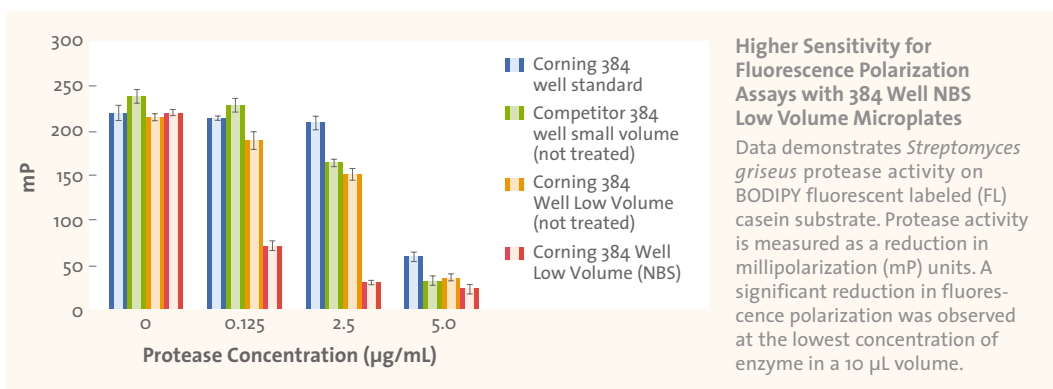


384 Well Clear Bottom Black and White Microplates

#### 384 Well Clear Bottom Black and White Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Black Clear Bottom Microplates</i>						
3711	Standard Plate	Flat	Not Treated	No	25	100
3540	Low Volume	Flat	Not Treated	No	10	50
3655	Standard Plate	Flat	NBS	No	25	100
<i>White Clear Bottom Microplates</i>						
3706	Standard Plate	Flat	Not Treated	No	25	100
3653	Standard Plate	Flat	NBS	No	25	100

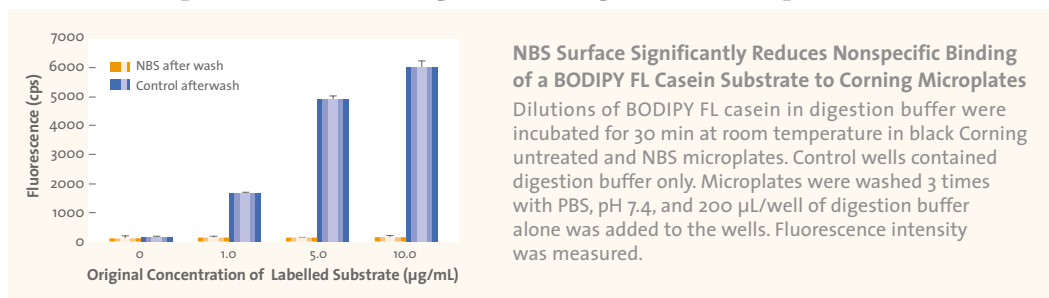
### Fluorescence-based Assay Performance with Corning® NBS Low Volume Microplates



#### Higher Sensitivity for Fluorescence Polarization Assays with 384 Well NBS Low Volume Microplates

Data demonstrates *Streptomyces griseus* protease activity on BODIPY fluorescent labeled (FL) casein substrate. Protease activity is measured as a reduction in millipolarization (mP) units. A significant reduction in fluorescence polarization was observed at the lowest concentration of enzyme in a 10 µL volume.

### Reduced Nonspecific Protein Binding with Corning® NBS™ Microplates

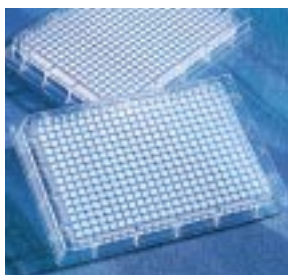


### 384 Well UV Microplate

- Offers certified performance at 260 nm and 280 nm
- Provides consistently low background and well to well uniformity
- Performance approaches that of quartz cuvettes. Certified DNase- and RNase-free.

#### 384 Well UV Microplate Ordering Information

Cat. No.	Plate Format	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
3675	Standard Plate	Flat	Not Treated	No	5	25



384 Well UV Microplates

## 2 384 WELL CELL CULTURE MICROPLATES

Corning 384 well microplates for cell culture include the tissue culture treated, Corning CellBIND® Surface, and poly-D-lysine coated microplates. The tissue culture treated microplates have the same surface treatment used on other Corning cell culture vessels while the poly-D-lysine treatment improves attachment of anchorage-dependent cells. The new Corning CellBIND Surface treatment can provide improved consistency and even cell attachment.

### 384 Well Cell Culture Polystyrene Microplates

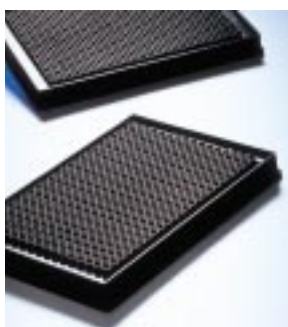
These cell culture plates are designed for general cell culture assays requiring clear plates.

- Standard well volume of 112 µL; working volumes of 20 to 80 µL
- Low volume plate has well volume of 50 µL; working volume of up to 40 µL
- The new optical imaging plate is designed for fixed or whole cell imaging and has superior well flatness for improved throughput
- Sterilized by gamma radiation and certified nonpyrogenic

#### 384 Well Cell Culture Microplate Ordering Information

Cat. No.	Plate Format	Surface Treatment	Well Bottom	Sterile	Qty/Pk	Qty/Cs
<i>Clear Cell Culture Microplates</i>						
3701	Clear Plate, with Lid	TC-Treated	Flat	Yes	20	100
3662	Clear Plate, with Lid	Poly-D-Lysine	Flat	Yes*	25	100
<i>Black and White Cell Culture Microplates</i>						
3709	Solid Black Plate, with Lid	TC-Treated	Flat	Yes	20	100
3704	Solid White Plate, with Lid	TC-Treated	Flat	Yes	20	100
<i>Black and White Clear Bottom Cell Culture Microplates</i>						
<b>New</b> 3542	Low Volume Black plate with Clear Bottom, with Lid	TC-Treated	Flat	Yes	10	50
3712	Black plate with Clear Bottom, with Lid	TC-Treated	Flat	Yes	20	100
<b>New</b> 3683	Black plate with Clear Bottom, with Lid	Corning CellBIND Surface	Flat	Yes	10	50
3664	Black plate with Clear Bottom, with Lid	Poly-D-Lysine	Flat	Yes*	25	100
<b>New</b> 3985	Black Optical Imaging Plate with Clear Bottom and Lid	TC-Treated	Flat	Yes	20	100
3707	White plate with Clear Bottom, with Lid	TC-Treated	Flat	Yes	20	100
3663	White plate with Clear Bottom, with Lid	Poly-D-Lysine	Flat	Yes*	25	100

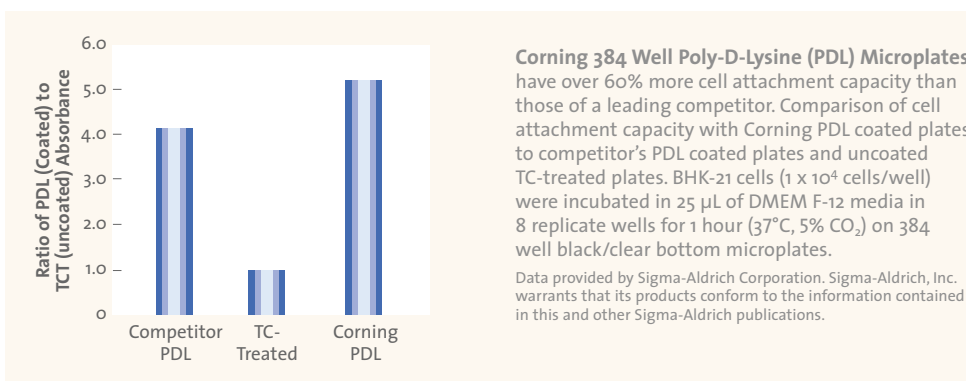
\*Aseptically manufactured



384 Well Low Volume Black Clear Bottom Microplates



### Performance of Corning® 384 Well Poly-D-Lysine Microplates



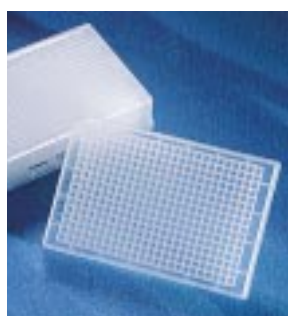
### 3 384 WELL POLYPROPYLENE STORAGE MICROPLATES

Corning polypropylene microplates offer both small volume and large volume (blocks) well formats to meet assay and storage requirements.

#### 384 Well Polypropylene Microplate Dimensions and Well Volumes

Well Shape	Total Well Volume ( $\mu$ L)	Well Depth (mm)	Well Diameter (mm)	Plate Dimensions (L x W x H) (mm)
384 Well Low Volume Low Profile Plate	20	6.30	3.30	127.76 x 85.48 x 10.00
384 Well Round Bottom Plate	95	11.56	3.63	127.76 x 85.48 x 14.22
384 Well Round Bottom Block	180	25.11	3.63	127.76 x 85.48 x 27.81
384 Well V-Bottom Block	240	22.31	3.30	127.76 x 85.48 x 24.73

- ▶ Resistant to many common organic solvents (e.g., DMSO, ethanol, methanol)
- ▶ Black polypropylene microplate (Cat. No. 3658) is ideal for fluorescent assays requiring solvent resistance
- ▶ Certified DNase- and RNase-free
- ▶ Available sterile or nonsterile
- ▶ Refer to the Microplate Accessories section for information about microplate accessory products including sealing tapes and mats.



384 Well Polypropylene Storage Microplates

#### 384 Well Polypropylene Microplate Ordering Information

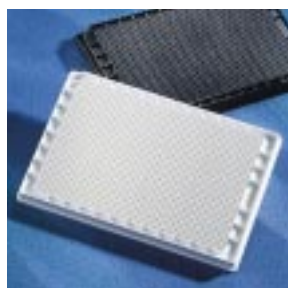
Cat. No.	Plate Format	Well		Sterile	Qty/Pk	Qty/Cs
		Well Bottom	Volume ( $\mu$ L)			
<i>Polypropylene Microplates</i>						
3658	Standard Plate, Black	Round	95	No	25	100
3656	Standard Plate, Clear	Round	95	Yes	25	100
3657	Standard Plate, Clear	Round	95	No	25	100
New 3672	Low Volume, Low Profile, Clear	Conical	20	No	10	50
<i>Polypropylene Blocks</i>						
3964	384 Well Block, Clear	Round	180	Yes	5	25
3965	384 Well Block, Clear	Round	180	No	5	100
New 3342	384 Well Block, Clear	V	240	Yes	5	50
New 3347	384 Well Block, Clear	V	240	No	5	50

# 1536 Well Microplates

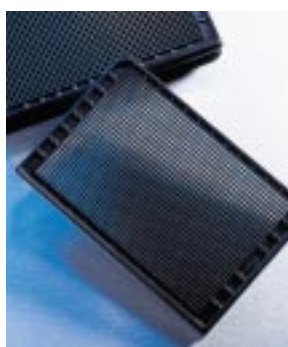
Corning® 1536 well microplates are the highest density microplates available for high throughput screening. The microplates conform to standard microplate footprint and dimensions. The 2 µL well microplate is a thinner plate and represents leading edge technology in assay miniaturization, with the length and width dimensions and microplate footprint meeting industry standards.

## 1536 Well Polystyrene Microplates

- For fluorescent and luminescent assays
- Total well volume of 10 µL for round well plates and 12.8 µL for flat bottom plates
- Recommended working volume of up to 8 µL
- Round well bottoms for reduced air entrapment and improved CVs and Z factor
- Raised well bottoms for higher sensitivity
- Flood reservoir on four sides to reduce instrument contamination
- Lids are available separately. (Information on lids and other microplate accessories can be found beginning on page 64.)



1536 Well Solid Round Bottom Microplates

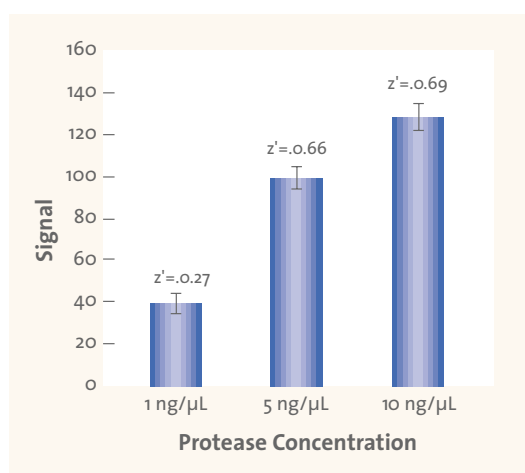


1536 Well Black Clear Bottom Microplates

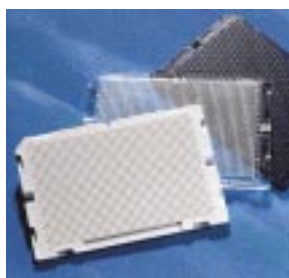
## 1536 Well Polystyrene Microplate Ordering Information

Cat. No.	Plate Format	Color	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
<i>Solid Black and White Microplates</i>							
3937	Standard Plate	White	Round	Not Treated	No	10	50
3936	Standard Plate	Black	Round	Not Treated	No	10	50
New 3724	Standard Plate, nontreated	Black	Flat	Not Treated	No	10	50
New 3726	Standard Plate, with Lid	Black	Flat	TC-Treated	Yes	10	50
New 3728	Standard Plate	Black	Flat	NBS™ Surface	No	10	50
New 3725	Standard Plate	White	Flat	Not Treated	No	10	50
New 3727	Standard Plate, with Lid	White	Flat	TC-Treated	Yes	10	50
New 3729	Standard Plate	White	Flat	NBS Surface	No	10	50
<i>Black Clear Bottom Microplates</i>							
New 3891	Clear bottom	Black	Flat	Not Treated	No	10	50
New 3893	Clear bottom, with Lid	Black	Flat	TC-Treated	Yes	10	50
New 3895	Clear bottom	Black	Flat	NBS Surface	No	10	50

## Performance of Corning 1536 Well 10 µL Round Well Microplates



**Fluorescent Polarization Assay on Corning 1536 10 µL Assay Microplate**  
 10 ng/µL, 5 ng/µL and 1 ng/µL of *Streptomyces griseus* protease were incubated with 2.0 ng/µL of BODIPY FL casein substrate in 5 µL volumes for 10 minutes at room temperature. (Corning 1536 Well 10 µL black microplate, untreated, Cat. No. 3936).



1536 Well 2 µL Polystyrene Microplates

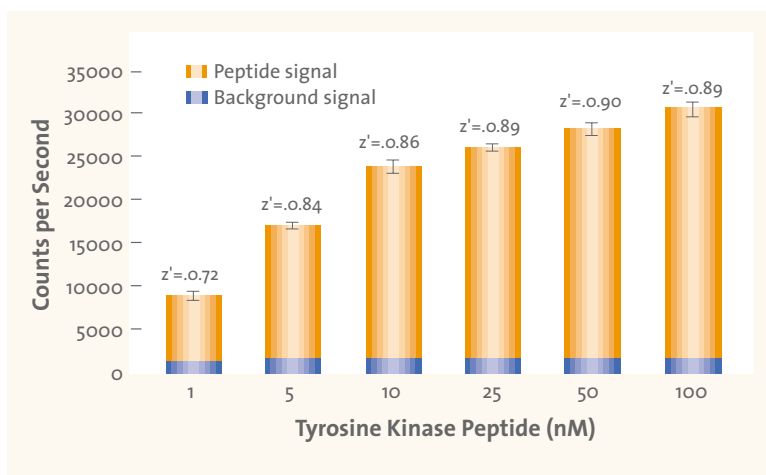
### 1536 Well 2 µL Polystyrene Microplates

- ▶ A variety of assays, including enzyme assays, receptor-ligand assays, and cell-based assays have been effectively performed in these plates.
- ▶ Recommended working volume of up to 1.5 µL
- ▶ The plates are demarcated in a 8 x 12 array with each square containing 16 wells
- ▶ Eight extra wells on both the left and right sides of the plate that can be used to run controls
- ▶ Series of notches that allow stacked plates to be easily separated from one another
- ▶ Lids are not available for these microplates. (Information on lids and other microplate accessories can be found beginning on page 64.)

### 1536 Well 2 µL Polystyrene Microplate Ordering Information

Cat. No.	Plate Format	Color	Well Bottom	Surface Treatment	Sterile	Qty/Pk	Qty/Cs
3851	Low Volume Plate	Black	Round	Not Treated	No	20	100
3854	Low Volume Plate	Black	Round	TC-Treated	Yes	20	100
3850	Low Volume Plate	Clear	Round	Not Treated	No	20	100
3853	Low Volume Plate	Clear	Round	TC-Treated	Yes	20	100
3858	Low Volume Plate	Clear	Round	High Bind	No	20	100
3852	Low Volume Plate	White	Round	Not Treated	No	20	100
3855	Low Volume Plate	White	Round	TC-Treated	Yes	20	100
3857	Low Volume Plate	White	Round	High Bind	No	20	100

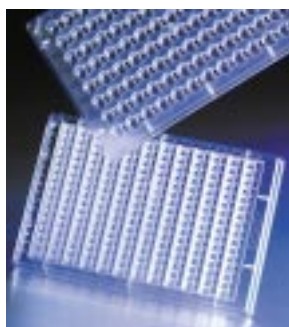
### Performance of Corning 1536 Well 10 µL Round Well Microplates



#### Model TR-FRET Tyrosine Kinase Assay

Using a range of concentrations of biotinylated, phosphorylated, tyrosine kinase peptide with 2 nM Eu-PT66 antiphosphotyrosine antibody as the energy donor and 75 nM APC-SA as the energy acceptor. Signals were detected from 5 µL total volumes in a model TR-FRET tyrosine kinase assay in a Corning 1536 Well 10 µL white assay plate, untreated (Cat. No. 3937). The contribution of the background signal to the total signal is shown.

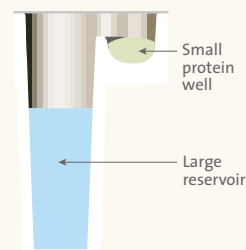
## Protein Crystallization Microplates



96 and 384 Well Protein Crystallization Microplates

### High Performance Well Design

Corning 96 and 384 Well Crystallization Microplates have unique well designs for sitting-drop crystallization.



96 Well Crystallization Microplate with Universal Optical Sealing Tape

- ▶ Corning® 96 and 384 well crystallization microplates are used for high-throughput protein crystal growth and screening.
- ▶ Designed for sitting-drop crystallization
- ▶ Meet 96 and 384 well microplate standards for automation
- ▶ Manufactured from an advanced polymer with high resistance to commonly used solvents, including acetone, acetic acid, butanone, ethanol, isopropanol, methanol, DMSO, nitric acid (65%), sulfuric acid (40%), hydrochloric acid (36%), and ammonia solution (33%)
- ▶ Polymer exhibits low background polarization and provides high optical clarity allowing protein crystals to be easily viewed under polarized light with minimal background interference
- ▶ Low water absorption of the polymer prevents loss of protein drop volume

### 96 Well Crystallization Microplate

- ▶ Features 96 large reservoir (reagent) wells and 96 corresponding protein wells
- ▶ Conical bottom protein wells provide better centering of the protein drop
- ▶ 210 µL well volume for the reservoir well and 10 µL for the protein well
- ▶ Compatible with manual pipettors and automation
- ▶ Novel merged well design provides efficient vapor space for protein crystallization

### 384 Well Crystallization Microplate

- ▶ The only microplate designed for full automation in crystal screening, built to meet industry standards for 384 well microplate footprint and well locations
- ▶ Features 192 reservoir wells and 192 corresponding protein wells
- ▶ Flat bottom protein wells
- ▶ 105 µL well volume for the reservoir well and 4 µL for the protein well
- ▶ Reservoir wells and protein wells are positioned to be compatible with multihead dispensing equipment (up to 96 well heads)

### Universal Optical Sealing Tape for 96 and 384 Well Crystallization Microplates

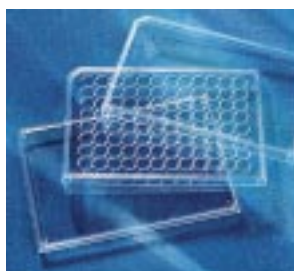
- ▶ This high optical quality, pressure-sensitive tape ensures tight sealing to minimize evaporation.
- ▶ Ideal for microscopic observation of protein crystals
- ▶ Suitable for use between -70° and 100°C
- ▶ Compatible with commonly used aqueous solutions and organic solvents

### Crystallization Microplate and Sealing Tape Ordering Information

Cat. No.	Plate Format	Reservoir Well Volume (µL)	Protein Well Volume (µL)	Sterile	Qty/ Pk	Qty/ Cs
3773	96 Well Plate, conical bottom	210	10	No	10	50
3785*	96 Well Plate, conical flat bottom, treated	210	7	No	10	50
3775	384 Well Plat, flat bottom	100	3.4	No	10	50
6575	Universal Optical Sealing Tape	N/A	N/A	No	100	100

\*Surface processed for hydrophilicity

## Microplate Accessories



Lids

### Optimizing Sealing Conditions on Corning Polypropylene Microplates

Corning offers an application note (Corning Literature No. ALSP-AN-011) describing effective sealing with the ABgene® ALPS-100 automated plate sealer.



Corning Storage Mat Applicator

### Lids

- ▶ All lids are made of rigid polystyrene except where indicated
- ▶ All lids have a corner notch on the A1 corner (except where indicated) to correspond to the corner notches found on all Corning® microplates
- ▶ The Universal Lid without a corner notch (Cat. No. 3098) does not need to be oriented in any particular direction to be placed on Corning plates. The lid also has a shorter skirt than standard lids
- ▶ The black Universal Lid (Cat. No. 3935) is suitable for fluorescent and other light-sensitive assays
- ▶ The DMSO-resistant cyclic-olefin lid (Cat. No. 3085) is tinted amber in color for light-sensitive assays and is 100% DMSO-resistant

### Microplate Lid Ordering Information

Cat. No.	Description	Plate Compatibility	Sterile	Qty/Pk	Qty/Cs
3930	Lid with corner notch and condensation rings	96 well microplates only (not 2 mL block)	Yes	1	100
3931	Lid with corner notch and condensation rings	96 well microplates only (not 2 mL block)	Yes	25	50
3098	Universal Lid without corner notch	All microplates	Yes	25	100
3099	Universal Lid with corner notch	All microplates	Yes	25	50
3935	Black Universal Lid with corner notch	All microplates	Yes	25	50
3085	DMSO-resistant Cyclic-olefin Lid without corner notch	All microplates	No	25	50
3849	1536 Well 2 $\mu$ L Lid	2 $\mu$ L 1536 Well Microplates only	Yes	20	100

### Storage Mats and Accessories

- ▶ Fits our 96 well plates and blocks
- ▶ Storage Mats Cat. Nos. 3080 and 3083 are manufactured from EVA (ethyl vinyl acetate), and polymer is compatible with DMSO
- ▶ Storage Mats Cat. Nos. 3346 and 3341 are chemical resistant
- ▶ Certified DNase- and RNase-free
- ▶ Can be applied manually or with our Storage Mat Applicator

### Storage Mats and Accessories Ordering Information

Cat. No.	Description	Sterile	Qty/Pk	Qty/Cs
3080	Round well Storage Mat for 96 well plates and blocks	No	25	100
3083	Square well Storage Mat for Corning 2 mL square blocks	No	1	50
New 3346	Storage Mat for Expanded Volume 96 Well Microplates	No	10	50
New 3341	Storage Mat for 384 Well V-Bottom Blocks	No	10	50
3081	Storage Mat Applicator	N/A	1	1



96 and 384 Well Robolids

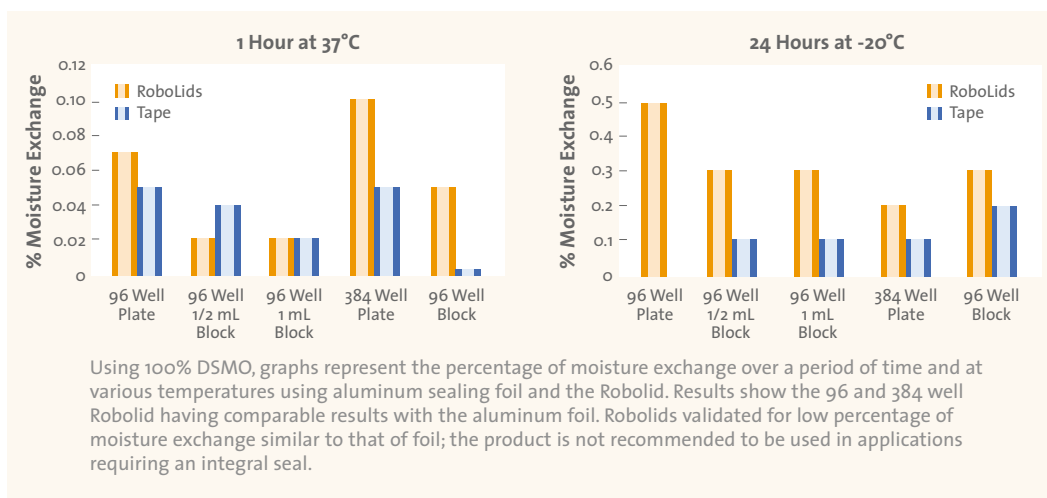
### Robolids

- ▶ Combines the sealing ability of a storage mat with the rigidity of a plastic lid
- ▶ Designed for repeated application and removal by automation and to prevent short-term evaporation
- ▶ Silicone sealing plugs for organic solvent resistance and low extractables
- ▶ Can be used manually or with automation

### Robolid Ordering Information

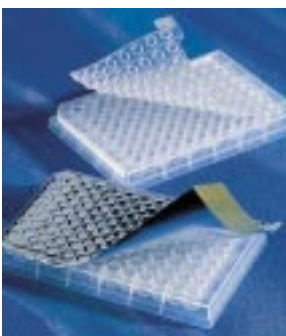
Cat. No.	Description	Sterile	Qty/ Pack	Qty/ Case
3090	96 Well Robolid with corner notch	No	25	50
3089	384 Well Robolid with corner notch	No	25	50

### Moisture Exchange with Corning® Robolids



### Sealing Tapes

- ▶ Easy application and removal for short- and long-term storage
- ▶ Provide tight seal to minimize evaporation and condensation
- ▶ Acetate Sealing Tape (Cat. No. 3095) is suitable for use between -16°C and 38°C, is transparent, and is not pierceable
- ▶ Aluminum Sealing Tape (Cat. No. 6569, 6570) is suitable for use between -80°C and 150°C, is not transparent, and is pierceable
- ▶ Breathable Sealing Tape (Cat. No. 3345) allows gas exchange across the surface
- ▶ Universal Optical Sealing Tape (Cat. No. 6575) is suitable for use between -70°C and 100°C, and is transparent



Sealing Mats and Tapes

### Sealing Tape Ordering Information

Cat. No.	Description	Sterile	Qty/Pk	Qty/Cs
3095	Acetate Sealing Tape for all microplates	No	100	100
6570	Aluminum Sealing Tape for 96 well microplates	No	100	100
6569	Aluminum Sealing Tape for 384 well microplates	No	100	100
3345	Breathable Sealing Tape	Yes	50	500
6575	Universal Optical Sealing Tape	No	100	100



## Technical Appendix

### Properties of Some Thermoplastics

		Polystyrene	Polyvinylchloride	Polypropylene
<i>Physical Characteristics</i>	Basic Properties	Biologically inert, rigid, excellent optical qualities	Biologically inert, and flexible	Biologically inert, high chemical resistance, exceptional toughness
	Clarity	Clear	Clear	Translucent
	Autoclave Compatibility	No	Yes	Withstand several cycles
	Heat Distortion Point	147-175°F 64-80°C		275°F 135°C
	Burning Rate	Slow	Slow	Slow
<i>Effects of Laboratory Reagents</i>	Weak Acids	None	None	None
	Strong Acids	Oxidizing acids attack	Oxidizing acids attack	Oxidizing acids attack
	Weak Alkalis	None		None
	Strong Alkalis	None		None
	Organic Solvents	Soluble in aromatic chlorinated hydrocarbons		Resistant below 80°C

Portions of this table courtesy of Modern Plastics Encyclopedia. Most data are from tests by A.S.T.M. methods. Tables show averages or ranges. Many properties vary with manufacturer, formulation, testing laboratory, and specific operating conditions.

### Corning Surface Technologies Properties and Applications

Surface	Applications/Assays	Binding Interaction	Sample Properties	Performance Criteria
<i>Untreated Polystyrene</i>	<ul style="list-style-type: none"> <li>General assays</li> <li>Immunoassays (EIA/RIA)</li> </ul>	Hydrophobic	High molecular weight (>20 kD). Large or abundant hydrophobic regions.	Well to well CV ≤5%. Average high and low wells from the mean ≤15%.
<i>NBS™</i>	<ul style="list-style-type: none"> <li>Homogeneous assays (e.g., luminescent and fluorescent assays)</li> <li>Enhances signal to noise ratio</li> </ul>	Non-ionic hydrophilic	Ability to reduce significantly (<2 ng/cm <sup>2</sup> ) protein and nucleic acid binding to polymers, maintain enzyme activity, and inhibit adhesion of a number of cell lines.	At least 95% reduction of nonspecific binding of protein compared to untreated polystyrene.
<i>High Binding</i>	<ul style="list-style-type: none"> <li>General assays</li> <li>Immunoassays (EIA/RIA)</li> </ul>	Hydrophobic and ionic	Medium to high molecular weight. Positively charged. +/- hydrophobic regions.	Well to well CV ≤3%. Average high and low wells from the mean ≤8%.
<i>Tissue Culture</i>	<ul style="list-style-type: none"> <li>Cell culture</li> </ul>	Hydrophilic	Negative charged (carboxyl groups) for cell attachment.	
<i>Poly-D-Lysine</i>	<ul style="list-style-type: none"> <li>Cell-based assays</li> <li>Enhancing cell attachment, growth, and differentiation</li> <li>Numerous cell lines have been cultured on PDL coated surfaces including HEK-293, NIH3T3, L929, 3T3, and PC12</li> </ul>	Hydrophilic and ionic	Coated with PDL (70 to 150 kDa). Uniform net positive charge.	
<i>Corning® CellBIND® Surface</i>	<ul style="list-style-type: none"> <li>Cell-based assays</li> <li>Improved consistency and even cell attachment</li> </ul>	Hydrophilic and ionic	Negative charged for cell attachment	

## Selected Corning Technical Literature

All literature is available in PDF file format at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

### Assay Microplates

#### *Binding Comparison of Polymer Surfaces: Introducing Non-Binding Surface Microplates*

Corning® 96-well NBS™ microplates are ideal for homogeneous assays in high throughput screening. Studies of protein and nucleic acid binding to the NBS, when compared to polystyrene and polypropylene surfaces, demonstrate significant reduction in nonspecific binding.

#### *Chemiluminescent HRP-Based Assay Using Corning White Microplate*

A comparison of the performance of white microplates from several microplate manufacturers to that of Corning 96 well white microplate using a model HRP based luminescent assay system.

#### *Corning Non-Binding Surface Microplates for Fluorescent HTS Assays*

This 4-page technical note evaluates the efficacy of the Corning NBS microplate for use in a homogeneous fluorescence polarization protease assay.

#### *Corning Non-Binding Surface Treatment to Reduce Non-Specific Binding To Microplates*

This 2-page technical note evaluates Corning NBS microplates for Scintillation Proximity Assays.

#### *Corning 384 Well Low Volume Microplate Performance in Miniaturized Assays*

This technical note describes the performance of Low Volume microplates using a homogeneous fluorescence polarization assay at low volumes.

#### *Design and Performance of the Corning 2 µL 1536 Well Plate*

This 2-page technical note describes the design features and performance criteria for Corning 2 µL 1536 well microplates.

#### *Fluorescent Polarization Kinase Assay Miniaturization in Corning 96 Well Half Area and 384 Well Microplates*

This 4-page technical note examines assay miniaturization in Corning 96 well, 96 well Half Area, and 384 well microplates using fluorescence polarization tyrosine kinase assays.

### Cell Culture Microplates

#### *Helpful Hints to Manage Edge Effects of Cultured Cells for High Throughput Screening*

This technical note is a compendium of techniques, collected from Corning Cell Culture facilities and customers, to reduce the occurrence of irregular patterns of cell adhesion or “edge effect” in microplates.

#### *Poly-D-Lysine Coated Microplates*

This 2-page application report describes binding and performance characteristics, and provides operating protocols for Corning’s poly-D-lysine microplates.

### Immunoassay Microplates

Corning offers five ELISA Technical Bulletins:

- ▶ Immobilization Principles — Selecting the Surface
- ▶ Optimizing the Immobilization of Protein and other Biomolecules
- ▶ Effective Blocking Procedures
- ▶ Optimizing the Separation Step on 96 Well Plates
- ▶ Selecting the Detection System – Colorimetric, Fluorescent, Luminescent

### Storage Applications

#### *Corning Clear-Pro™ 96 Well Polypropylene Microplates*

This 4-page technical note describes the heat sealing and storage performance characteristics for Corning ClearPro microplates.

#### *New Storage Mat Applicator System Meets Customers’ Strict Storage Requirements*

This 2-page application note describes the performance characteristics of the Corning Storage Mat Applicator and the Corning products with which it is compatible.

#### *Recommendations for Heat Sealing Corning Polypropylene Storage Products Using the ABgene® Automated Laboratory Plate Sealer*

This 3-page application note describes the critical parameters for sealing Corning microplates with the ABgene Automated Laboratory Plate Sealer.



# Genomics

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## Overview

### FROM START TO FINISH – MEETING THE NEEDS OF THE GENOMICS LABORATORY

Corning's dedication to quality and technology has produced this comprehensive line of products for the genomics laboratory. Whatever aspect of research you are involved in – from culturing cells or microorganisms to printing and hybridizing DNA arrays, Corning's quality and breadth of line delivers reliable results. All of Corning's products are manufactured under stringent quality guidelines as an assurance of consistent performance from device to device and lot to lot. Featured in this brochure are our newest products for the high throughput genomics laboratory:

- ▶ Thermowell® Gold PCR reaction vessels for conventional and real-time PCR, and cycle sequencing
- ▶ 96 well half area UV plates for nucleic acid quantitation
- ▶ Low profile BioAssay dishes that are robotic friendly and maximize incubator and storage space

### THE EQUIPMENT COMPATIBILITY PROGRAM

The increasing use of automated laboratory equipment demands laboratory disposables whose fit and function have been qualified. Our microplates are designed with automation compatibility in mind and they meet industry standards for plate dimensions. In addition, Corning Life Sciences maintains a comprehensive equipment compatibility program in which leading equipment manufacturers certify the compatibility of our products with their instruments. This information is continually updated with our new products as well as new instruments. For the most current information, visit our website: [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

### LIFE SCIENCES EARLY ACCESS TO DEVELOPMENT – THE L.E.A.D. PROGRAM

Corning is committed to meeting the rapidly evolving needs of the life sciences laboratory. We are continually developing innovative new products that are compatible with the latest advances in technology and instrumentation. Our L.E.A.D. program gives researchers access to these products and special pricing prior to their full market release. Contact your local Corning Life Sciences office or representative for more information about the products currently available through this program.

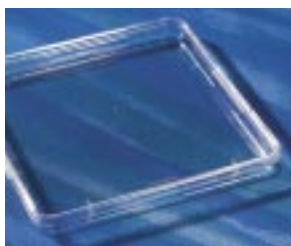
### EXPERT ASSISTANCE IS JUST A TELEPHONE CALL OR E-MAIL AWAY

Customer service and technical representatives are available to answer any question – from pricing and product availability to protocols and applications advice. Our offices around the world are able to respond promptly to your inquiry regardless of your location. Contact us at your local office (listed on the back cover).

## Colony Picking, Bacterial Growth, and Storage

### 245 mm Square BioAssay Dishes

Square bioassay dishes are made from polystyrene and are certified nonpyrogenic. They are packed with lids and are designed with a stacking bead so that they will stack securely without slipping. The dishes are compatible with automated colony picking instruments.



245 mm Square BioAssay Dish



Cat. No.	Description	Automation Compatibility	Qty/Pk	Qty/Cs
431111	245 mm x 245 mm, Square, 18 mm Deep Nontreated Dish, Sterile	PBA Flexys™ and the Genetix “Q” Bot® automated colony picking and gridding robots	4	16
431272	245 mm x 245 mm, Square, 18 mm Deep Nontreated Dish, Sterile	AutoGen AutoGenesys, BioRobotics BioPick, BioGrid, TAS and MicroGrid II high volume automated colony picking systems	4	16
431301	245 mm x 245 mm, Low Profile, Sterile, Nontreated Dish	PBA Flexys, Genetix “Q” Bot, BioRobotics, BioPick	5	20

### 96 and 384 Well Polypropylene Blocks for Growth and Storage

These 96 and 384 well deep well blocks feature well designs for optimal liquid handling and meet industry standards for dimensions to facilitate automated handling. They are certified DNase- and RNase-free. For storage mats and accessories, see page 64.



384 Well Polypropylene Blocks

Cat. No.	Description	Well Shape	Sterile	Well Volume	Qty/Pk	Qty/Cs
3956	96 Well	Round V	Yes	0.5 mL	10	50
3957	96 Well	Round V	No	0.5 mL	100	100
3958	96 Well	Round	Yes	1 mL	5	25
3959	96 Well	Round	No	1 mL	5	100
3960	96 Well	V-Bottom	Yes	2 mL	5	25
3961	96 Well	V-Bottom	No	2 mL	5	100
3964	384 Well	Square-Round	Yes	180 µL	5	25
3965	384 Well	Square-Round	No	180 µL	5	100
3342	384 Well	Square V	Yes	240 µL	5	50
3347	384 Well	Square V	No	240 µL	5	50

### Disposable Culture Flasks

Disposable plastic Erlenmeyer flasks are made from optically clear polycarbonate and feature a wide, easy access mouth. The polycarbonate construction also delivers mechanical strength for shaker culture applications. Each flask is individually packaged and radiation sterilized. The polypropylene plug seal caps offer two positions: open to allow gas exchange or closed for a liquid-tight seal. The vent caps allow free gas exchange while offering a liquid-tight, contamination-free seal.



Disposable Plastic Erlenmeyer Flasks

Cat. No.	Capacity (mL)	Graduations (mL)	Neck Diameter (mm)	Cap Style	Sterile	Qty/Pk	Qty/Cs
430421	125	25	26	Plug Seal	Y	1	50
431143	125	25	26	Vent Cap	Y	1	50
430183	250	25	31	Plug Seal	Y	1	50
431144	250	25	31	Vent Cap	Y	1	50
430422	500	50	43	Plug Seal	Y	1	25
431145	500	50	43	Vent Cap	Y	1	25
431146	1000	50	43	Plug Seal	Y	1	25
431147	1000	50	43	Vent Cap	Y	1	25



# Purification

## FiltrEX™ 96 and 384 Well Filter Plates

Corning® FiltrEX filter plates meet the industry standards for plate dimensions. The rigid side walls make the plate ideal for automation and the wide skirt accepts bar codes. Individual filter disks are encapsulated in the plate by a patented\* process that ensures 100% integrity of each well. The design of the nozzle prevents sample cross-contamination and wicking. Glass fiber filter plates can be used for a variety of applications, such as plasmid isolation, DNA purification, PCR† clean-up or receptor/ligand binding assays. They are a cost-saving alternative to expensive DNA prep kits. Use the low-binding hydrophilic PVDF membrane for lysate clarification, protein kinase assays, or bead- or resin-based separation assays. Visit the Technical Information Center at our web site for additional application information.



384 FiltrEX Filter Plates

### 384 Well FiltrEX Filter Plates

Cat. No.	Membrane	Pigment	Sterile	Well Volume (µL)	Qty/Pk	Qty/Cs
3531	0.45 µm PVDF	White	No	180	5	25
3533	0.66 mm Glass Fiber	White	No	180	5	25



96 FiltrEX Filter Plates

### 96 Well FiltrEX Filter Plates

Cat. No.	Description	Sterile	Well Volume (µL)	Qty/Pk	Qty/Cs
3504	0.2 µm PVDF Membrane, Hydrophilic	No	350	10	50
3505	0.2 µm PVDF Membrane, Hydrophilic	Yes	350	10	50
3510	0.25 mm Glass Fiber Filter	No	350	10	50
3511	0.66 mm Glass Fiber Filter	No	350	10	50
<b>New</b> 3514	Fluid Guard for FiltrEX 96 Well Filter Plates	No	–	100	100

Please contact us for customized membranes.

\*U.S. Patent No. 6,391,241

†PCR is covered by patents owned by Hoffman-LaRoche Inc., Nutley, NJ. Use of the PCR process requires a license.

## Volume Adapter and Applicator

A volume adapter allows larger volumes (up to 1 mL) to be applied to the 96 well filter plates. The applicator easily assembles and disassembles the filter plate and adapter, and ensures a perfect, leak-free fit.



Volume Adapter

Cat. No.	Description	Qty/Pk	Qty/Cs
3584	Volume Adapter, Nonsterile	10	50
3507	Applicator	1	1

## Collection Microplates

FiltrEX 96 and 384 well filter plates meet industry standards for plate dimensions and can be used with a broad range of collection plates. Polystyrene and polypropylene plates are available with a variety of well geometries. Commonly used collection plates are listed below. For information about other compatible collection plates, please contact us.

Cat. No.	Description	Well Volume (µL)	Qty/Pk	Qty/Cs
3371	96 Well Round Bottom Polypropylene ClearPro™ Plate	360	25	100
3795	96 Well Round Bottom Polystyrene Plate	360	25	100
3897	96 Well V-Bottom Polystyrene Plate	320	25	100
3657	384 Well Polypropylene Plate	95	25	100
3965	384 Well Polypropylene Block	180	5	100
3702	384 Well Polystyrene Plate	125	25	100

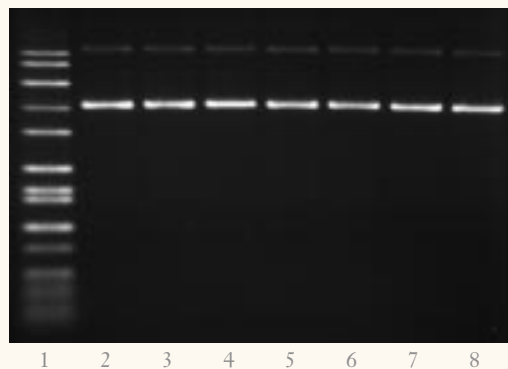


### FiltrEX™ 96 and 384 Well Filter Plate Construction



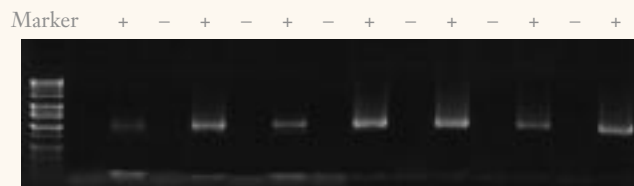
The proprietary nozzle design and individual, integrally-sealed filter disks prevent filtrate cross contamination and wicking. The rigid construction and wide skirt allow for robotic handling and bar coding.

### FiltrEX Filter Plate Performance

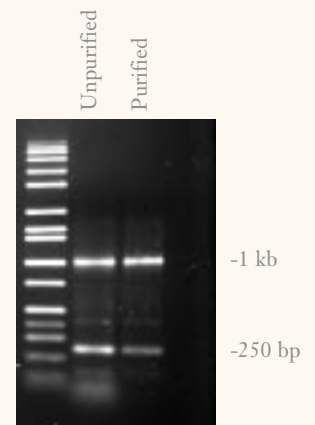


**Agarose gel electrophoresis of Plasmid DNA prepared using Corning® FiltrEX 384 well filter plates.**

Plasmid DNA samples isolated with glass fiber filter plates were separated in a 1% agarose gel in 1X TAE buffer. Lane 1 contains 10 µL of Hi-Lo™ markers (total DNA = 1 µg). Lanes 2-8 contain plasmid preparations isolated using 7 different wells of the filter plate. Plasmid DNA was recovered in approximately 55 µL total volume. Two microliters (2 µL) of recovered plasmid were loaded in each lane of the gel.



**Integrally sealed wells eliminate sample cross contamination.** Alternating wells of negative control (-) or plasmid DNA (+) filtered through FiltrEX 384 well Filter Plates were analyzed for cross-contamination by PCR. PCR products were not detected in the negative control wells, indicating the absence of contaminating DNA.



**PCR Clean-Up**

PCR products were purified using a FiltrEX 384 well glass fiber filter plate. Primer dimers were efficiently removed with good recovery of the PCR products.



Spin-X Centrifuge Tube Filters

### Spin-X® Centrifuge Tube Filters

Spin-X centrifuge tube filters consist of a membrane-containing filter unit within a centrifuge tube. They filter by centrifugation for bacteria removal, particle removal, HPLC sample preparation, removal of cells from media and DNA removal from agarose or acrylamide gels. Maximum RCF\*\* is 16,000 x g.

Cat. No.	Membrane	Well Volume (working $\mu\text{L}$ )	Pore Size ( $\mu\text{m}$ )	Tube Size (mL)	Qty/Cs
8160	CA	500	0.22	2.0	96
8161*	CA	500	0.22	2.0	100
8162	CA	500	0.45	2.0	96
8163*	CA	500	0.45	2.0	100
8169*	NY	500	0.22	2.0	200
8170*	NY	500	0.45	2.0	200

CA = Cellulose Acetate, NY = Nylon

\*Indicates that the product is nonsterile and certified nonpyrogenic.

\*\*RCF = Relative Centrifugal Force.

### Spin-X Tube Purification of DNA from Agarose Gels

#### Introduction

Purification of DNA from an agarose gel with the Spin-X tube is quick and efficient, unlike the electroelution, dialysis, and “freeze-squeeze” methods. The Spin-X method consists of two simple steps: excision of the band from the gel and centrifugation in the Spin-X tube. Yields range from 30 to 80%.

#### Protocol\*

1. Electrophorese DNA in an agarose gel containing ethidium bromide.
2. After electrophoresis, illuminate the gel under long wavelength UV light, then, using a sharp instrument, carefully excise the band of interest (30-15,000 bp).
3. Place the gel slice into the filter cup of the Spin-X tube (Cat. No's. 8160, 8161, 8162, 8163) and mix with 100 to 200  $\mu\text{L}$  of distilled water or Tris-EDTA.
4. Spin the tube at about 13,000 x g for 5 to 20 minutes at room temperature.
5. Collect the DNA from the microcentrifuge tube; the agarose gel will be retained on the Spin-X membrane. If needed, ethanol precipitate the DNA to remove any EDTA present.

#### Note: DNA yield may increase with the incorporation of one or all of the following steps:

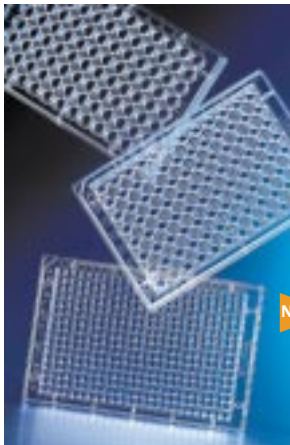
1. Macerate the gel slice prior to placement in the Spin-X tube.
2. Prior to centrifugation in step #4, freeze the gel slice at  $-70^{\circ}\text{C}$  in a separate tube, then allow to thaw.
3. After the initial centrifugation, add an additional 200  $\mu\text{L}$  of buffer to the Spin-X tube and centrifuge again.
4. Spin for a longer period of time.

\*Schwarz, Herbert and Whitton, J. Lindsay, 1992. A Rapid, Inexpensive Method for Eluting DNA from Agarose or Acrylamide Gel Slices Without Using Toxic or Chaotropic Materials. Vol. 13, No. 2, Biotechniques.

# Quantitation and Detection

## 96 and 384 Well UV Microplates

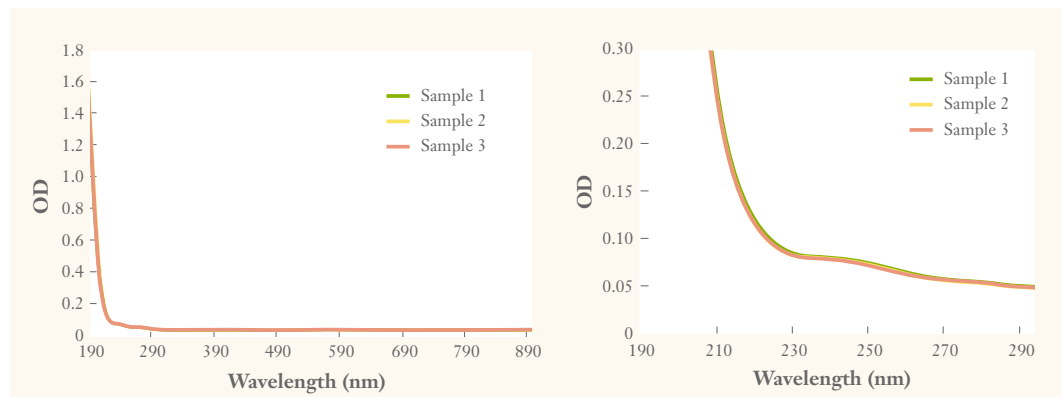
These plates have a unique UV-transparent bottom; ideal for determining protein and/or nucleic acid concentrations. The UV-transparent bottom is molded to the top without adhesives for greater strength and maximum leak resistance. Plates are certified for low background and consistent performance at 260 and 280 nm. Their broad linear detection range allows reliable detection of high and low concentrations of biomolecules.



96 Well Half Area, 96 and 384 Well UV Microplates

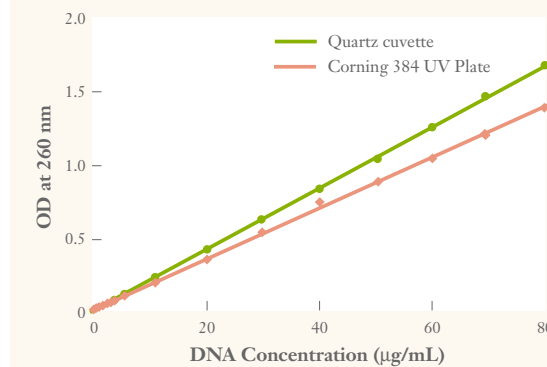
Cat. No.	Format	Bottom	Well Volume (µL)	Qty/Pk	Qty/Cs
3635	96 Well	Flat	370	25	50
3675	384 Well	Flat	125	5	25
3679	96 Well Half Area	Flat	205	25	50

## 384 Well UV Microplate Performance



### Background absorbance of three samples of the Corning 384 well UV plate bottom material.

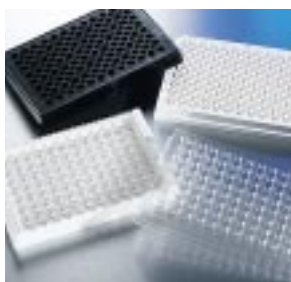
This material features consistently low absorbance over a broad wavelength range, including well into the UV. The three samples showed negligible background absorbance across the entire visible spectrum (left panel) and very low background in the UV range (right panel).



### Comparison of DNA detection with the Corning 384 well UV plate to individual samples read in a quartz cuvette.

For each indicated DNA concentration, triplicate 100 µL samples were read in a quartz cuvette with a Beckman DU® spectrophotometer. Six samples (90 µL) were read in a Corning 384 well UV plate at each concentration with a Tecan ULTRA™ reader. These sample volumes were chosen in order to maintain a 1 cm path length (smaller volume samples can be read in the UV plate). The Corning UV plate demonstrates a broad linear range enabling the reliable detection of high and low concentrations as well as good sample to sample consistency (CV's of <2% at 50 µg/mL DNA).

### DNA-BIND® Assay Microplates

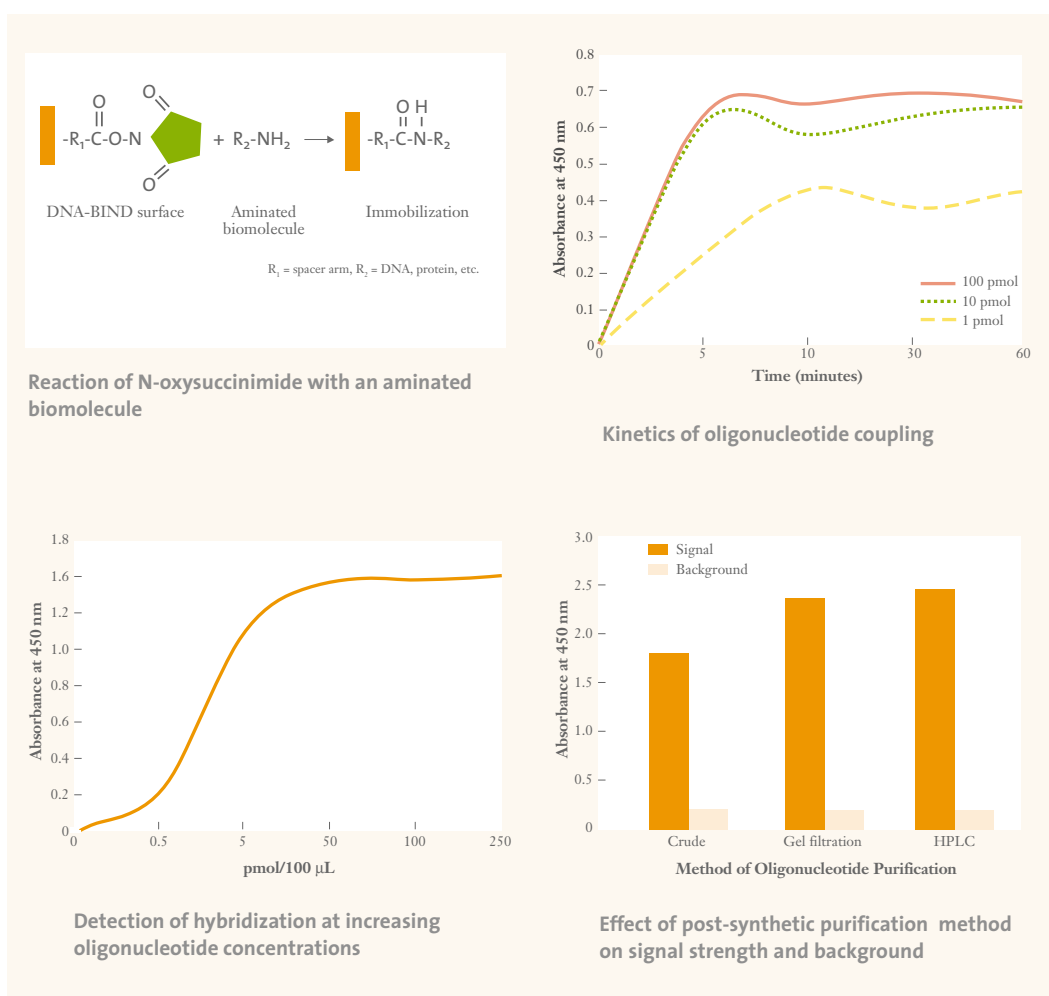


DNA-BIND Assay Microplates

DNA-BIND surface covalently couples to amine groups, providing a convenient method to immobilize aminated single-stranded DNA by either the 5' or 3' end for hybridization, amplification, or other DNA-based assays. 96 well plates and 1 x 8 Stripwell™ plates come without lids. Protocols and application information are available on our web site: [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

Cat. No.	Format	Well Shape	Qty/Pk	Qty/Cs
2497	1 x 8 Stripwell Plate, White	Flat	1	50
2498	96 Well Plate, Solid Black	Flat	1	50
2499	96 Well Plate, Solid White	Flat	1	50
2505	96 Well Plate, Clear	Flat	1	50
2506	1 x 8 Stripwell Plate, Clear	Flat	1	50
2525	96 Well Plate, Clear	Flat	1	10

### DNA-BIND Surface Performance



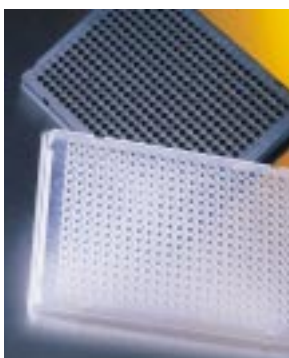
# DNA Amplification

## Thermowell® GOLD PCR† Reaction Vessels from Corning

Thermowell GOLD PCR reaction vessels exemplify Corning’s commitment to innovation: to develop superior quality, reliable, and versatile products to complement today’s dynamic changes in technology. The wide variety of options offered by Thermowell GOLD provides researchers the choices necessary for complete compatibility with laboratory equipment. Look to Thermowell GOLD for PCR, sequencing, and real-time PCR.

### Thermowell GOLD 384 Well Polypropylene PCR Microplates and Accessories

Thermowell GOLD 384 well PCR microplates feature exceptional dimensional stability following thermocycling, and are fully compatible with automation, commonly used thermal cyclers, and Applied Biosystems® sequencing adapters (see compatibility table).



Thermowell GOLD 384 Well PCR Microplates

Cat. No.	Description	Qty/Pk	Qty/Cs
3757	384 Well Polypropylene PCR Microplate, clear	10	50
3756	384 Well Polypropylene PCR Microplate, black	10	50
3699 <sup>a</sup>	Silicone Rubber Sealing Mat – 384 Well Microplates	1	25
6569	Aluminum Sealing Tape-384 Well Microplates	100	100
6575	Universal Optical Sealing Tape	100	100

<sup>a</sup>Thermowell Sealing Mats, available for 384 Well PCR Plates, are easy to apply and remove, fully autoclavable and reusable (at least five times). These silicone rubber mats offer a cost effective alternative to other sealing methods and provide 100% sealing when used in conjunction with clamp or screw-down heated lid thermal cyclers.

### Thermowell GOLD and Thermowell 96 Well Polypropylene PCR Microplates and Accessories

Thermowell GOLD 96 well PCR microplates are offered in five formats to ensure maximum flexibility and a perfect match for your applications. The original Thermowell 96 well PCR microplates are universal fit and can be cut into 3 x 8 well segments.



Thermowell GOLD 96 Well Polypropylene PCR Microplates

Cat. No.	Description	Qty/Pk	Qty/Cs
6551	96 Well Microplate, Clear – Thermowell	25	25
3752	96 Well Microplate, Full Skirt, Clear – Thermowell GOLD	10	50
3751	96 Well Microplate, Full Skirt, Black – Thermowell GOLD	10	50
3753	96 Well Microplate, Half Skirt, Clear – Thermowell GOLD	10	50
3755	96 Well Microplate, Half Skirt, Black – Thermowell GOLD	10	50
3754 <sup>b</sup>	96 Well Microplate, Elevated Skirt, Clear – Thermowell GOLD	10	50

<sup>b</sup>Fully compatible with ABI 3700 and 3730.

### Polycarbonate PCR Microplates

Cat. No.	Format	Model Name	Well Volume (µL)	Qty/Pk	Qty/Cs
6509	96 Well	Model P	200	1	25
6511	96 Well	Model M	200	1	25

### Thermal Cycler Compatibility Guide for Polycarbonate PCR Microplates

Cat. No.	Name	Compatible Thermal Cyclers
6509	Model P	Applied Biosystems GeneAmp® PCR System 9600 <sup>c</sup> , Barnstead Thermolyne Amplitron II®, Techne® Cyclogene, and Gene E with 96 x 0.2 mL block
6511	Model M	MJ Research PTC-100-96V, PTC-200 DNA Engine™, Biometra Uno - Thermoblocker™, Coy Corporation Temp Cycler II, Corbett Research FTS-960, Hybaid OmniGene with Microblock, Quatro BioSystems T-C-40

<sup>c</sup>Requires the use of the Spacer Block and Frame (Cat. No. 6527).

<sup>†</sup>PCR is covered by patents owned by Hoffman-LaRoche Inc., Nutley, NJ. Use of the PCR process requires a license.

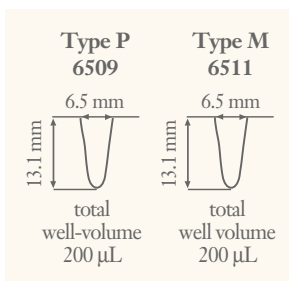


Plate Well Dimensions

### 96 Well Polycarbonate PCR Microplates with DNA-BIND® Surface

DNA-BIND Thermowell® M PCR plates can be used in solid phase applications such as DNA synthesis, conventional PCR reactions, mRNA isolation and RT-PCR, and standard DNA hybridization assays.

Cat. No.	Format	Model Name	Well Volume (µL)	Qty/Pk	Qty/Cs
6573	96 Well	Model M	200	1	25

### PCR Sealing Tape and Sealing Mats

Sealing tapes prevent evaporation and enable oil-free operation when used with thermal cyclers with heated lids. The universal optical sealing tape can be used in detection coupled with PCR systems (real-time PCR).

Cat. No.	Description	Qty/Pk	Qty/Cs
6524	Polyethylene Sealing Tape-96 Well Microplates	100	100
6569	Aluminum Sealing Tape-384 Well Microplates	100	100
6570	Aluminum Sealing Tape-96 Well Microplates	100	100
6575	Universal Optical Sealing Tape for Real Time PCR	100	100
6555	Thermowell™ Sealing Mat-96 Well Microplates	1	25
3699	Thermowell Sealing Mat-384 Well Microplates	1	25
3087	Silicone Rubber Septa Mat	10	50



Sealing Tape, Sealing Mats, and Cap Strips for PCR

### Thermowell GOLD and Thermowell PCR Tubes

Individual PCR tubes are made of thin wall polypropylene and designed for precise fit in heat blocks to optimize heat transfer. Tubes are tested and certified to be free of DNase and RNase, are autoclavable at 121°C and withstand centrifugation to 10,000 x g.

Cat. No.	Volume (mL)	Cap Style	Color	Qty/Pk	Qty/Cs
<i>Individual Polypropylene PCR Tubes – Thermowell GOLD</i>					
3745	0.2	Flat	Clear	500	1,000
3744	0.2	Flat	Assorted	500	1,000
3747	0.2	Dome	Clear	500	1,000
3746	0.2	Dome	Assorted	500	1,000
3750	0.5	Flat	Clear	500	1,000
3749	0.5	Flat	Assorted	500	1,000
<i>Individual Polypropylene PCR Tubes – Thermowell</i>					
6530	0.5	Flat	Clear	250	1,000
6531	0.2	Dome	Clear	96	960
6571	0.2	Flat	Clear	96	960



Thermowell GOLD PCR Tubes



### Thermowell® GOLD 8 Well PCR Tube Strips

Tube strips consist of eight 0.2 mL thin wall polypropylene tubes connected together. Dual connectors between adjacent tubes eliminate inadvertent breakage during sample handling. Tube strips are designed for precise fit in thermal cyclers to optimize heat transfer. Thermowell GOLD cap strips are sold separately from Thermowell GOLD tube strips. Original Thermowell tube strips and cap strips are packaged together. Tube strips are tested and certified to be free of DNase/RNase contamination and are autoclavable at 121°C.



Thermowell GOLD 8 Well PCR Tube Strips

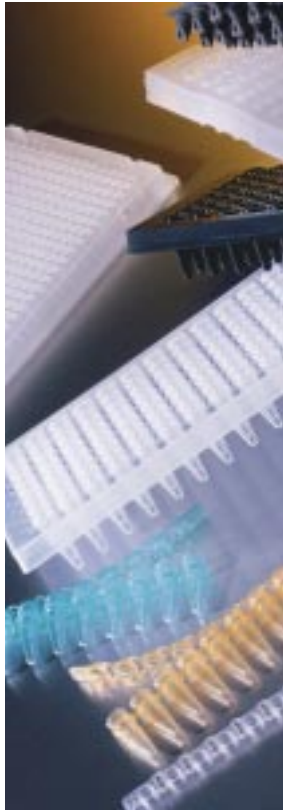
Cat. No.	Description	Qty/Pk	Qty/Cs
3741	0.2 mL 1 x 8 Tube Strips, Clear – Thermowell GOLD	125	1,250
3740	0.2 mL 1 x 8 Tube Strips, Assorted Colors - Thermowell GOLD	125	1,250
6542	0.2 mL 1 x 8 Tube Strips, Clear – Thermowell	60	300
6547*	0.2 mL 1 x 8 Tube Strips, Assorted – Thermowell	60*	300
3743	1 x 8 Cap Strips, Domed, Clear – Thermowell GOLD	125	1,250
3748	1 x 8 Cap Strips, Domed, Assorted Colors – Thermowell GOLD	125	1,250
3742	1 x 8 Optically Clear Flat Cap Strips, for RT-PCR** – Thermowell GOLD	125	1,250

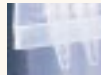

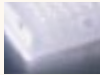
\*60 of each color per bag; 1 bag of each color per case.

\*\*Optically Clear Flat Cap Strips are designed for real-time PCR. Suitable for use with Thermowell GOLD 0.2 mL 1 x 8 PCR tube strips and 96 well microplates.

See page 80 for Compatibility Guide and Volume Reference table.

## Compatibility Guide for Thermocyclers, Sequencers, and Real Time PCR



		Thermowell GOLD Microplates		
				
		96 Well Half Skirt	96 Well Full Skirt	384 Well
<b>Thermal Cyclers</b>				
Applied BioSystems®	GeneAmp® 9600 GeneAmp 9700	■		■
Biometra®	Uno® Uno II® T1 Thermocycler® Tgradient® Trobot®	■	■	■
Bio-Rad®	iCycler™	■		■
Eppendorf	MasterCycler®	■	■	
Ericomp	SingleBlock® TwinBlock® Deltacycler I®	■		
Flexi	Gene Genius		■	■
ThermoHybaid	PCR Sprint® PCR Express® MultiBlock System Touchdown® Omnigene® Omn-E®	■	■	■
MJ Research™	PTC 200 DNA Engine™ PTC 225 DNA Tetrad® PTC 100®	■	■	■
MWG™	Primus 96® Primus 384®	■	■	■
Stratagene®	Robocycler®		■	■
TaKaRa	TP 240® TP 3000®	■	■	
Techne®	Touchgene X®	■	■	■
<b>RT-PCR Thermal Cyclers</b>				
Applied BioSystems	ABI PRISM® 7000 ABI PRISM 7700 ABI PRISM 7900 HT	■	■	■
Bio-Rad	iCycler®		■	
Stratagene®	Mx 4000®		■	
<b>Sequencers</b>				
Applied BioSystems	ABI PRISM 3100 ABI PRISM 3700 ABI PRISM 3730	■		■
Amersham Biosciences	MegaBACE™ 500 MegaBACE 1000 Mark II MegaBACE 4000		■	■
MJ Research™	BaseStation® Transgenomic		■	

### Thermowell GOLD PCR Microplates Volume Reference Table

Format	Total Volume	Working Volume
384 Well PCR Microplates	55 µL	50 µL
96 Well PCR Microplates, Full Skirt	240 µL	200 µL
96 Well PCR Microplates, Half Skirt	340 µL	300 µL
96 Well PCR Microplates, Elevated Skirt	340 µL	300 µL

## Bar Code Customization



### Dependable Durability

Bar codes have been quality tested for optimal readability, chemical resistance and temperature variation.

### What is a Bar Code\*?

The same kind of bar codes you see in stores and supermarkets can be very useful to your lab. Consisting of a series of black bars and light spaces representing letters and/or numerals, a bar code is an easy-to-use vehicle for data collection. The specific arrangement of these bars and spaces follows strict rules known as a “symbology.”

### How Does a Bar Code Work?

Bar codes reflect spots of light into a scanner in varying amounts. These differences in reflection are translated into electrical signals by a light detector inside the scanner. The signals are converted into binary ones and zeros, which are used in various combinations to stand for specific numbers and letters.

### Common Characteristics of a Bar Code

#### *The Quiet Zones*

The areas immediately adjacent to the beginning and the end of the bar code symbol. These zones define the parameters of the code. As a rule of thumb, zones should be 0.25" or larger to prevent misreads.

#### *Start and Stop Characters*

Found at the beginning and end of the bar code symbol. They tell the scanner from which direction information is being received.

#### *Interpretation Line*

Appears above or beneath a bar code where human readable information appears.

### Corning, Beyond the Common Bar Code

- ▶ 2.75" x 0.25" label size
- ▶ Linear (1-D) bar codes: Code 128, Code 3 of 9, Interleaved 2 of 5
- ▶ 10 Mil Narrow Bar Element (X-dimension = 0.010")
- ▶ Multiple bar code labels on a single plate
- ▶ Label placement on any side of a Corning microplate
- ▶ Customer sequence is electronically stored and can be maintained even if plates or projects change.

### Custom Designed Bar Codes

Corning will assist in designing and implementing a bar code label to meet your exact specifications. We will provide bar code label test samples at the front end of a project, to confirm decodability and ensure flawless performance in your end-use process. Our other customization features include:

- ▶ Flexible bar code and corresponding human readable layout/orientation on the bar code label, for compatibility with the internal bar code scanner inside your automated instruments
- ▶ Color coding
- ▶ Superior print quality and resolution
- ▶ Flexible bar code label positioning
- ▶ Resistant to most commonly used organic solvents

### Expert Advice

Most Corning genomics products are suitable for bar code customization. Contact Corning Life Sciences or your local representative for more information.

\*Information provided by Computype, Inc.



# Microarray

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## Overview

The quality and reliability of microarray results largely depend on the quality and consistency of both the glass substrate and the reagents used to manufacture and process the arrays. Corning has a history rich in science and technology, with expertise in glass and surface modification, optics, biochemistry and molecular biology, which has led to many innovations for life science research. Using this broad-based knowledge, Corning provides complete solutions to customers' complex problems and enables the achievement of breakthrough discoveries.

### TOOLS FOR EVERY STEP IN THE PROCESS

- ▶ Premium glass substrates for printing microarrays
- ▶ Optimized reagents for the highest possible performance and control throughout the microarray process
- ▶ Storage products to facilitate the process and preserve sample content

### SUPERIOR TECHNICAL AND APPLICATIONS INFORMATION

- ▶ Protocols included with every case of product, optimized from Corning's vast research experience
- ▶ On-line tools to verify cDNA labeling efficiency at [www.prontosystems.com](http://www.prontosystems.com)
- ▶ Expert assistance that is just an e-mail or phone call away
- ▶ Field Applications support with a direct link to our Applications Group

### UNPARALLELED MANUFACTURING PROCESSES

Corning® glass slides are manufactured using a proprietary coating process in a Class 100 cleanroom and undergo numerous quality control tests. Every slide is meticulously inspected for the presence of contaminating particulates, scratches and other defects before and after coating, ensuring a substrate of unmatched cleanliness, consistency, reliability and integrity.

The reagents in the Pronto!™ Microarray Kits and Pronto! *Plus* Microarray System are quality controlled to deliver consistency at every step in the process. They are optimized for use with Corning microarray slides, allowing the highest possible level of performance, standardization, and control.

## Slide Selection Chart

Slide Surface	Recommended Printed Content	Binding Interaction	Recommended Hybridization Solutions
<b>Epoxide Coated Slides</b>	cDNA, long oligonucleotides (>50-mer)	Covalent	Pronto! cDNA/Long Oligo Hybridization Solution
	Short oligonucleotides (~30-mer) with or without amino modifications	Covalent	Pronto! Short Oligo Hybridization Solution
<b>UltraGAPS™ Coated Slides</b>	cDNA, long oligonucleotides (>50-mer)	Ionic	Pronto! cDNA/Long Oligo Hybridization Solution
<b>GAPS™ II Coated Slides</b>	cDNA	Ionic	Pronto! cDNA/Long Oligo Hybridization Solution
	Proteins	Ionic	Ligand-dependent





# Microarray Printing



## Epoxide Coated Slides

Corning® Epoxide Coated Slides provide the optimal, uniform surface chemistry for covalent attachment of **unmodified or amino-modified short oligonucleotides** (~30-mer), as well as long oligonucleotides (>50-mer) and cDNA. The Pronto!™ Epoxide Spotting Solution (see p. 90), when used in conjunction with Corning Epoxide Coated Slides, provides superior spot size control for printing high density arrays. Use Corning Epoxide Coated Slides with the Pronto! Universal Hybridization Kit (see p. 93) to achieve the highest possible level of overall microarray performance.

**Versatility**

- ▶ Ideal for short oligonucleotides, long oligonucleotides, and cDNA
- ▶ Print with unmodified or amino-modified oligonucleotides
- ▶ No UV crosslinking or baking step required for DNA coupling

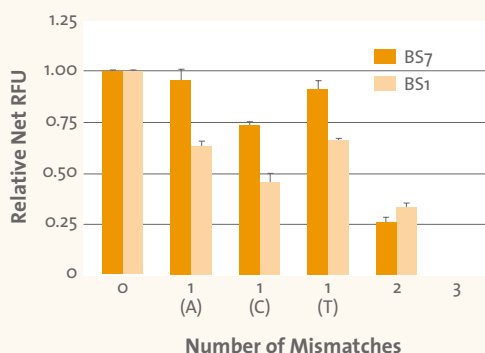
**Reproducibility** ▶ Interslide CVs below 10%

**Sensitivity** ▶ Detect 1 pg RNA spiked into 4 µg of total RNA sample

**Specificity** ▶ Differentiate between 90% homologous oligos (3 mismatches in 30-mer oligonucleotides)

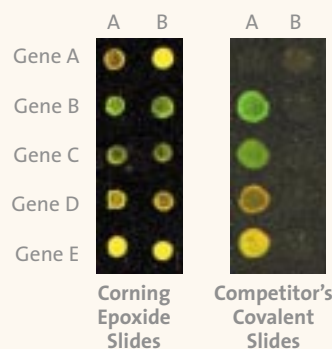
## Epoxide Coated Slides Ordering Information

Cat. No.	Description	Slides/Pk	Slides/Cs
40040	Epoxide Slide Starter Kit (10 Epoxide Coated Slides, 5 mL Epoxide Spotting Solution, 0.8 mL Short Oligo and 0.8 mL cDNA/Long Oligo Hybridization Solution)	5	10
40041	Epoxide Coated Slides with Bar Code	5	25
40042	Epoxide Coated Slides without Bar Code	5	25
40043	Epoxide Coated Slides with Bar Code, Bulk Pack	25	25
40044	Epoxide Coated Slides without Bar Code, Bulk Pack	25	25



### Differentiate Between 90% Homologous Oligonucleotides

Corning Epoxide Coated Slides and the reagents from Pronto! Universal Hybridization Kits perform together to differentiate between 90% homologous oligonucleotides (3 mismatches in 30-mer oligonucleotides). A study using mismatch oligonucleotides designed for two *B. subtilis* genes (BS7 and BS1) was performed. No mismatches (0), 1 mismatch (A, C, T) or multiple mismatches (2, 3) were tested for specificity of detection under identical processing conditions. As indicated in the above graph, there is a reduction in signal for each successive mismatch until no detectable signal is observed for 3 mismatches.



### Use Unmodified or Amino-Modified Oligonucleotides

Oligonucleotides (30-mer) were printed onto Corning Epoxide Coated Slides and a competitor's covalent slides, following recommended protocols. Oligonucleotides were either C6-amino modified at the 5' end (A columns) or unmodified (B columns). Cy<sup>5</sup>/Cy<sup>3</sup> ratios correlated strongly between modified and unmodified oligonucleotides for Corning Epoxide Slides, but the competitor's slides showed an absolute requirement for amino modification of the oligonucleotides.

### UltraGAPS™ Coated Slides



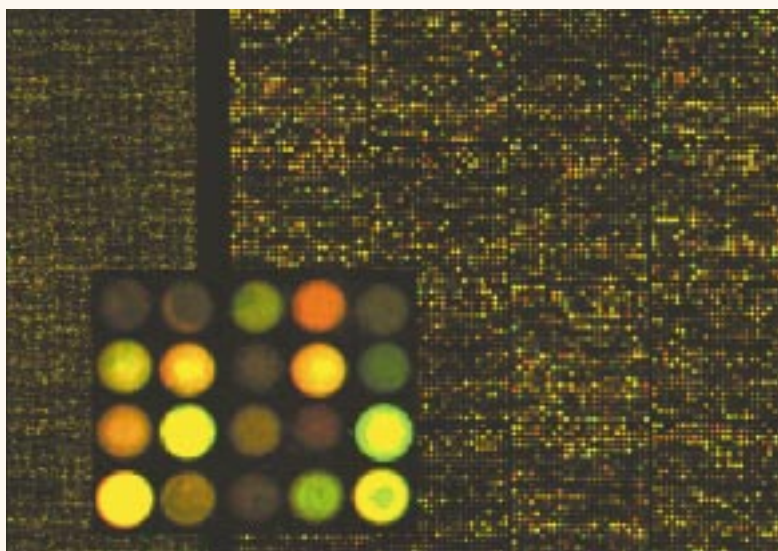
The Gamma Amino Propyl Silane surface on UltraGAPS Coated Slides is ideal for printing long (>50-mer) oligonucleotides, as well as cDNA. UltraGAPS Coated Slides have a more hydrophobic surface than competitors' slides, resulting in smaller, more consistent spot size. Each lot is tested for consistent spot morphology, signal intensity, and low background in a hybridization assay. Some of the applications for which UltraGAPS Coated Slides are ideally suited include: gene expression analysis, genotyping, and CGH (comparative genomic hybridization).

The Pronto!™ Universal Spotting Solution (see p. 89) has been optimized for use with the UltraGAPS Coated Slides and provides excellent spot morphology for microarray printing. Use the Pronto! Universal Hybridization Kit (see p. 93) in conjunction with these slides to achieve the highest level of microarray performance.

- Reproducibility**   ▶ Interslide CVs below 10%
- Dynamic Range**   ▶ Low background autofluorescence
- Manufacturing Excellence**
  - ▶ Consistent spot morphology
  - ▶ Uniform surface treatment
  - ▶ Higher hydrophobicity

#### UltraGAPS Coated Slides Ordering Information

Cat. No.	Description	Slides/Pk	Slides/Cs
40015	UltraGAPS Coated Slides with Bar Code	5	25
40016	UltraGAPS Coated Slides without Bar Code	5	25
40017	UltraGAPS Coated Slides with Bar Code, Bulk Pack	25	25
40018	UltraGAPS Coated Slides without Bar Code, Bulk Pack	25	25
40019	UltraGAPS Slide Starter Kit (Includes 10 UltraGAPS Coated Slides, 5 mL Universal Spotting Solution)	5	10
40024	Pronto! Universal Validation Kit (Includes 10 UltraGAPS Coated Slides, 15 mL Universal Spotting Solution, Pronto! Hybridization Kit for 10 arrays)	5	10
40025	Pronto! Universal Printing Kit (Includes 25 UltraGAPS Coated Slides, 50 mL Universal Spotting Solution)	25	25



#### 27,000 Feature Array on UltraGAPS Coated Slides (three magnifications)

A 27,000 feature array was printed on UltraGAPS slides, processed and hybridized using the reagents in the Pronto! Universal Hybridization Kit. The inset shows a magnification to highlight the low background, uniform spot morphology, and signal intensity of a the array.

*Data courtesy of A. Borg, Ph.D., Lund University, Sweden.*



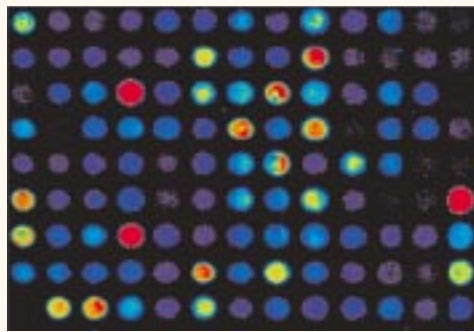
### GAPS™ II Coated Slides

GAPS II Coated Slides are manufactured from a proprietary ultraflat glass that enhances microarray performance, enabling more accurate reading of microarrays by confocal laser scanners. GAPS II Coated Slides are manufactured using the same coating process and attachment chemistry as the original GAPS amino-silane coated slides, enabling researchers to use the same protocols that they optimized for GAPS slides. Use GAPS II Coated Slides with the Pronto!™ Universal Hybridization Kit (see p. 93) to achieve maximum microarray performance.

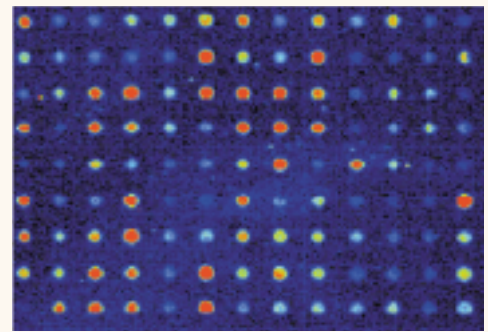
- Flexibility**      ▶ Recommended for both DNA and protein arrays
- Binding Capacity**      ▶ High DNA retention for maximum signal strength
- Dynamic Range**      ▶ Low background autofluorescence

#### GAPS II Coated Slides Ordering Information

Cat. No.	Description	Slides/Pk	Slides/Cs
40003	GAPS II Coated Slides with Bar Code	5	25
40004	GAPS II Coated Slides without Bar Code	5	25
40005	GAPS II Coated Slides with Bar Code, Bulk Pack	25	25
40006	GAPS II Coated Slides without Bar Code, Bulk Pack	25	25



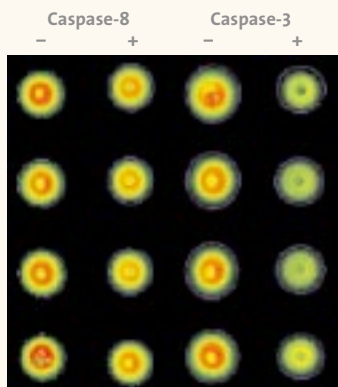
GAPS II Coated Slide



Ordinary Silane Coated Slide

#### Spot Morphology on GAPS II Coated Slides

Note uniform spot morphology, high signal strength, and ultra-low background with the GAPS II Coated Slide. Images courtesy of Dr. John Quackenbush of the Institute for Genomic Research (TIGR), Rockville, MD.



#### Functional Peptide Array on GAPS II Coated Slides

The Caspase-3 substrate NH<sub>2</sub>-DEVDA-Biotin was suspended in Corning® Epoxide Spotting Solution and printed in quadruplicate onto anhydride-derivitized GAPS II Coated Slides. Peptide arrays were incubated with avidin-Cy<sup>3</sup> in the absence or presence of Caspase-8 or Caspase-3 (as indicated), and scanned at 532 nm. The printed DEVDA peptide retained function on the array, as indicated by the reduced fluorescence seen in the spots treated with Caspase-3, but not Caspase-8. Note: GAPS II Coated Slides have also been used successfully for protein arraying without derivitization.

*Coleman et al., Proteomics 3 (11): 2101-07 (2003).*

### Pronto!™ Universal Spotting Solution



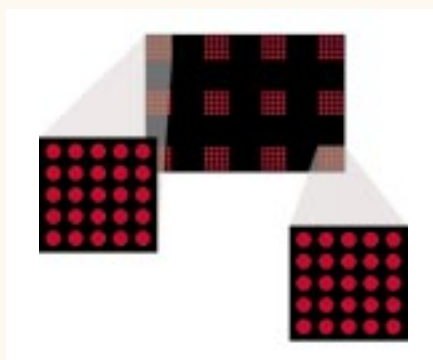
Pronto! Universal Spotting Solution is optimized for both long oligonucleotides (>50-mer) and cDNA printed on UltraGAPS™ Coated Slides. The proprietary formulation provides excellent spot morphology and has an extremely low evaporation rate. Pronto! Universal Spotting Solution is available in bulk as well as part of both the UltraGAPS Slide Starter Kit and Pronto! Universal Printing Kit.

- ▶ Low background autofluorescence
- ▶ Low evaporation rate
- ▶ Ensures consistent DNA printing concentration
- ▶ Eliminates need for volume adjustments
- ▶ Provides for even distribution of spotted DNA across entire array

#### Pronto! Universal Spotting Solution Ordering Information

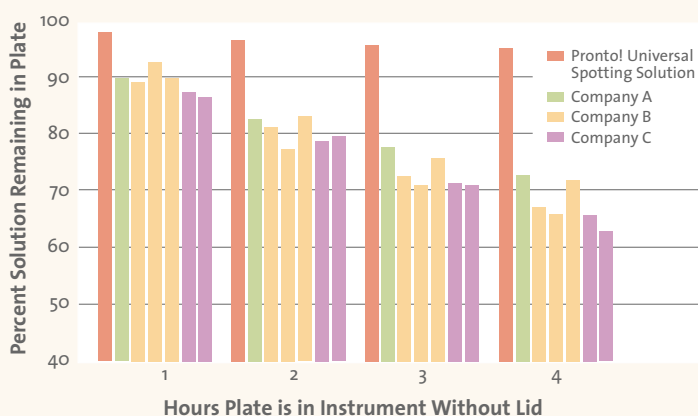
Cat. No.	Description	Qty/Pk	Qty/Cs
40027	Pronto! Universal Spotting Solution, 250 mL	1	1

Cat. No.	Description	Slides/Pk	Slides/Cs
40019	UltraGAPS Slide Starter Kit (Includes 10 UltraGAPS Coated Slides, 5 mL Universal Spotting Solution)	5	10
40025	Pronto! Universal Printing Kit (Includes 25 UltraGAPS Coated Slides and 50 mL Universal Spotting Solution)	25	25



#### Pronto! Universal Spotting Solution – Spot Uniformity

Quality control testing for Pronto! Universal Spotting Solution requires consistent spots when using 12 pins printed 25 times.



#### Pronto! Universal Spotting Solution – Low Evaporation

Pronto! Universal Spotting Solution evaporative losses are <5% over 4 hours, as compared to evaporative losses of >25% with other commercial spotting solutions.



### Pronto!™ Epoxide Spotting Solution

Pronto! Epoxide Spotting Solution should be used for printing all types of DNA including short oligonucleotides (~30-mer), long oligonucleotides (>50-mer), and cDNA printed on Corning® Epoxide Coated Slides. When used with Corning Epoxide Coated Slides, this spotting solution provides spot size control for printing high density arrays without contributing to background fluorescence. Pronto! Epoxide Spotting Solution is available in bulk (250 mL) or as part of the Corning Epoxide Slide Starter Kit.

- ▶ Provides controlled spot size for high density arrays
- ▶ No significant contribution to background fluorescence of arrays
- ▶ Low evaporation rate
- ▶ Enhanced spot morphology

#### Pronto! Epoxide Spotting Solution Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
40047	Pronto! Epoxide Spotting Solution, 250 mL	1	1
Cat. No.	Description	Slides/Pk	Slides/Cs
40040	Epoxide Slide Starter Kit (10 Corning Epoxide Coated Slides, 5 mL Pronto! Epoxide Spotting Solution, 0.8 mL Short Oligo Hybridization Solution)	5	10



#### Varying Spotting Solution Formulations to Adjust Spot Size

Pronto! Epoxide Spotting Solution formulation can be adjusted to alter spot size at will. DNAs were dissolved in Pronto! Epoxide Spotting Solution to which varying amounts of sodium dodecyl sulfate (SDS) had been added, and were printed in quadruplicate onto Epoxide Coated Slides using 120 μm solid pins. The top row (80 μm feature diameter) had no addition, whereas adding increasing amounts of SDS resulted in correspondingly larger feature diameters.



### 384 Well Microarray Printing Plates

Corning® 384 well polypropylene microplates are available in both low and full volume well formats to meet source plate requirements for printing DNA content onto microarray slides. The plates are manufactured from solvent resistant, virgin polypropylene that is compatible with many organic solvents including DMSO. The plates feature rigid, full length skirts for full compatibility with automation.

The 384 Well Low Volume Microarray Printing Plate (Cat. No. 3672), with a working volume of 2 to 20 μL, has a conical V-bottom, square well geometry that provides for maximum sample recovery. The 384 Well Full Volume Storage Plate (Cat. No. 3656) has a total well volume of 95 μL.

- ▶ Well design provides for maximum sample recovery
- ▶ Resistant to many organic solvents including DMSO
- ▶ Certified DNase- and RNase-free
- ▶ Automation compatible

#### 384 Well Microarray Printing Plates Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
3672	384 Well Microarray Printing Plate, Polypropylene, Low Volume	10	50
3656	384 Well Storage Plate, Polypropylene, Full Volume	25	100
6569	Aluminum Sealing Tape for 384 Well Microplates	100	100
3099	Universal Lid for 384 Well Microplates	25	50
3085	DMSO Resistant Lid for 384 Well Microplates	25	50



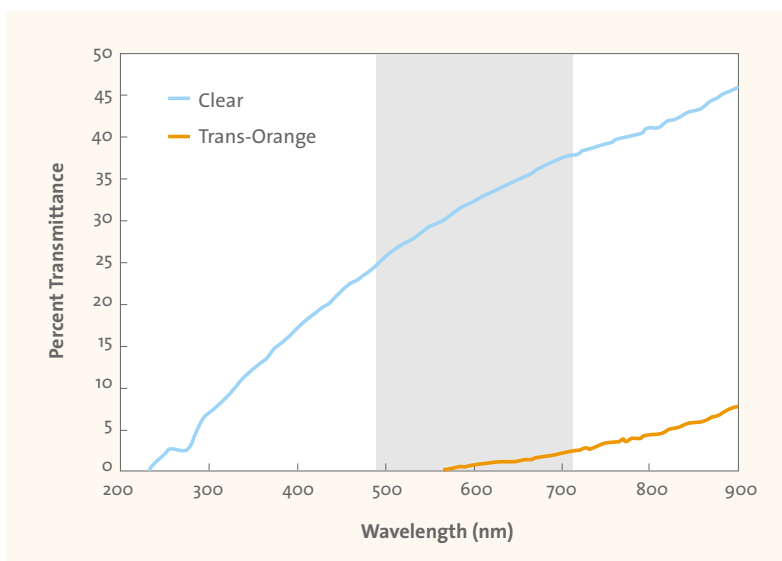
### Microarray Slide Mailers/Storage Boxes

The plastic containers in which UltraGAPS™ Coated Slides are shipped also function as storage boxes for printed arrays. These containers are available as either 5 slide mailers or 25 slide storage boxes. The trans-orange plastic has low transmittance in the 500 to 700 nm wavelength range which helps protect Cy®3 and Cy®5 dyes from photobleaching. These rigid plastic containers do not shed particles or outgas volatile chemicals that may contaminate microarray slides.

The Corning® 25 Slide Storage Box has a lift off lid which is easy to open and close. The 5 Slide Mailer has a hinged lid that snaps closed tightly to prevent slides from accidentally falling out.

#### Microarray Slide Mailers/Storage Boxes Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
40082	5 Slide Mailer for Microarrays	50	50
40081	25 Slide Storage Box for Microarrays	10	20



#### Transmittance Through Corning Trans-Orange Slide Mailers

Low transmittance (500-700 nm) helps protect Cy3 and Cy5 from photobleaching.

### Microarray Storage Pouches

Corning® Microarray Storage Pouches are the same pouches in which Corning UltraGAPS™ and Epoxide Coated Slides are shipped. These tear-resistant, laminated foil pouches can be used by customers for the storage of printed microarrays. They are available in two sizes for storing arrays in either 5 slide mailers (5 3/4" x 4 1/4" pouch) or 25 slide storage boxes (6" x 7 1/2" pouch).

When heat-sealed, the pouches provide microarrays with protection from light, humidity, and environmental contaminants. Each pouch comes affixed with a 3" x 4" white marking label.

#### Microarray Storage Pouches Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
40085	Microarray Storage Pouches for 5 Slide Mailers	50	50
40086	Microarray Storage Pouches for 25 Slide Mailers	50	50

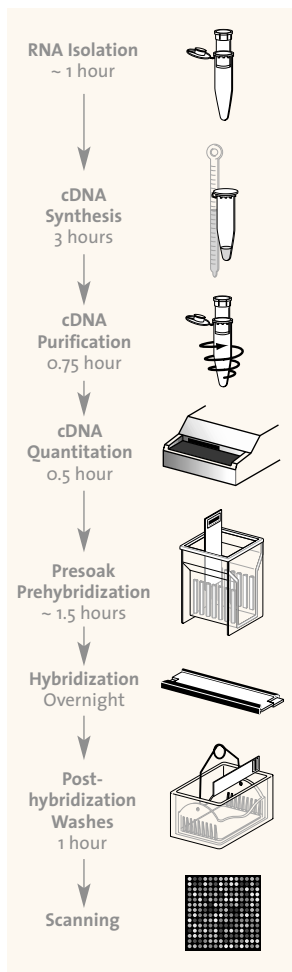




# Microarray Processing



## Process Flowchart



## Pronto!™ Plus Microarray System

The Pronto! *Plus* Microarray System, jointly developed by Corning Incorporated and Promega Corporation, is a fully integrated solution that enables researchers to generate reliable, reproducible, and sensitive microarray data. The system combines the SV Total RNA Isolation System and ChipShot™ Labeling System from Promega with the Pronto! Universal Printing Kit and Pronto! Universal Hybridization Kit from Corning. For additional information, visit [www.prontosystems.com](http://www.prontosystems.com).

Use the Pronto! *Plus* System to isolate and purify total RNA, synthesize fluorescently labeled cDNA, and hybridize the labeled samples to DNA microarrays printed on Corning® Epoxide, UltraGAPS™, or GAPS™ II Coated Slides.

- Reproducibility** ▶ Interslide CVs below 10%
- Sample Savings** ▶ Optimized for 5 µg of unamplified total RNA per direct labeling reaction
- Sensitivity** ▶ Detect 3 pg of spiked RNA in 5 µg total RNA sample
- Low Background** ▶ Reduce background autofluorescence by using presoak step
- Convenience** ▶ One system contains all reagents (except fluorescent dyes) for the complete processing of printed microarrays

The Pronto! *Plus* Microarray System is available in six different configurations to match all customer processes.

## Validation

Pronto! *Plus* Systems 1 and 2 are designed for core facilities or printing groups planning to validate their process from microarray manufacturing through hybridization (10 UltraGAPS™ Coated Slides and 15 mL of Pronto! Universal Spotting Solution included).

## RNA Purification, Labeling, and Hybridization

Pronto! *Plus* Systems 3 and 5 are designed for microarray researchers who purify total RNA, generate labeled cDNA, and hybridize to microarrays printed on Corning Epoxide, UltraGAPS, or GAPS II Coated Slides.

## Labeling and Hybridization

Pronto! *Plus* Systems 4 and 6 are configured for microarray researchers who obtain purified total RNA and need only to label cDNA and hybridize to microarrays printed on Corning Epoxide, UltraGAPS, or GAPS II Coated Slides.

## Pronto! Plus System Ordering Information

Cat. No.	Product	Reactions	UltraGAPS Slides	SV RNA Isolation	ChipShot™ Labeling	Pronto! Hybridization
40051	Pronto! <i>Plus</i> System 1	10	■	■	■	■
40052	Pronto! <i>Plus</i> System 2	10	■		■	■
40053	Pronto! <i>Plus</i> System 3	10		■	■	■
40054	Pronto! <i>Plus</i> System 4	10			■	■
40055	Pronto! <i>Plus</i> System 5	25		■	■	■
40056	Pronto! <i>Plus</i> System 6	25			■	■

### Pronto!™ Universal Hybridization Kits



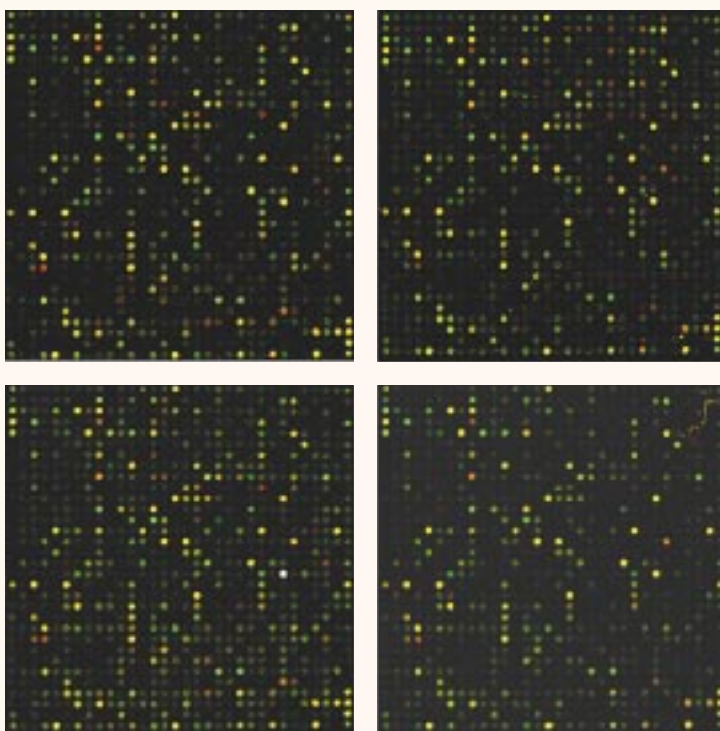
Pronto! Universal Hybridization Kits (Cat. Nos. 40026 and 40028) provide all of the reagents necessary to perform hybridizations of fluorescently labeled cDNA to microarrays printed on Corning® Epoxide, UltraGAPS™, or GAPS™ II Coated Slides. The Pronto! Universal Validation Kit (Cat. No. 40024) contains all of the reagents from above as well as 10 UltraGAPS Coated Slides and 15 mL of Universal Spotting Solution.

- Pre-Soak Solution**                   ▶ Remove existing autofluorescence from printed microarrays
- Pre-Hybridization Solution**   ▶ Block background fluorescence during array hybridization
- Hybridization Solutions**       ▶ Solutions compatible with cDNA, long oligonucleotide, and short oligonucleotide content
- ▶ Ready to use (no dilution required)
- ▶ Contain blockers to increase specificity
- Wash Solutions**                   ▶ Quality tested to ensure manufacturing consistency

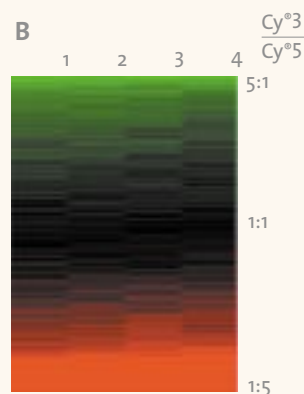
#### Pronto! Universal Hybridization Kit Ordering Information

Cat No.	Product	Reactions	SV RNA Isolation	ChipShot™ Labeling	Pronto! Hybridization
40024	Pronto! Universal Validation Kit (Includes 10 UltraGAPS Coated Slides, 15 mL Universal Spotting Solution)	10			■
40028	Pronto! Universal Hybridization Kit	10			■
40026	Pronto! Universal Hybridization Kit	25			■

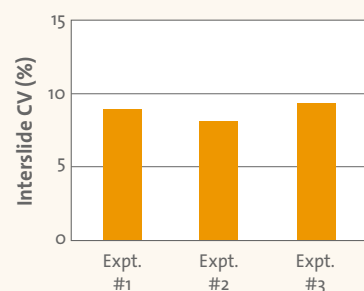
A



B

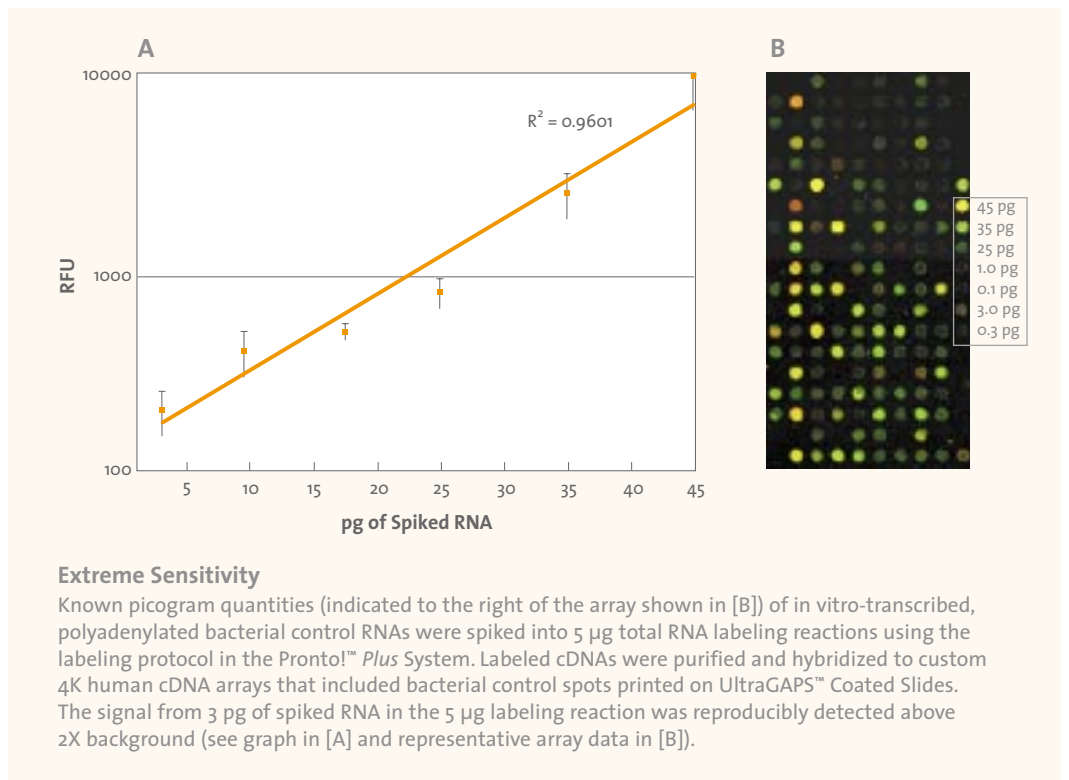
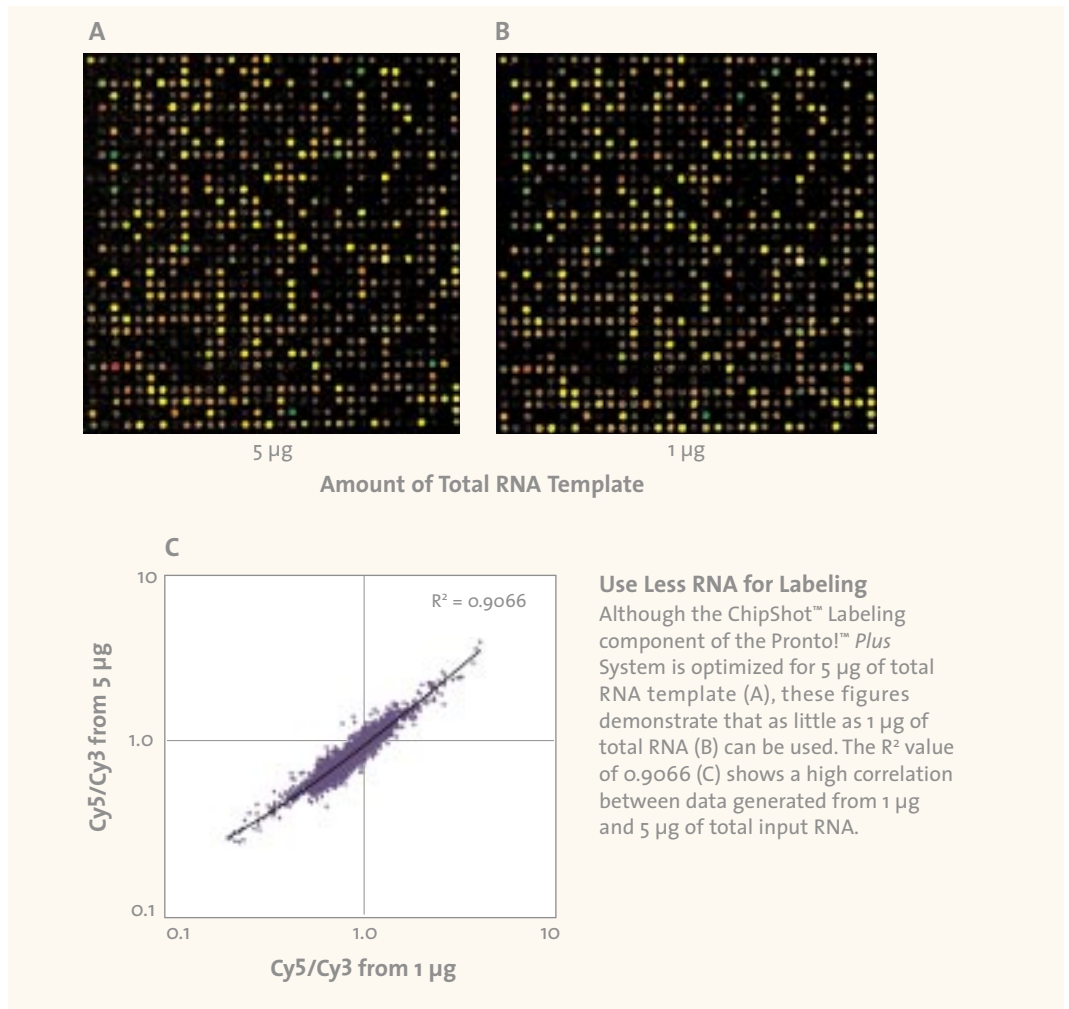


C



#### Superior Reproducibility

Four separate 4K arrays were processed using the Pronto!™ Plus System to demonstrate reproducibility (A). Differential gene expression patterns as represented by ratios of normalized Cy³/Cy⁵ in the cluster diagram were found to be very consistent between the four arrays (B). Interslide CVs were shown to be <10% for each of 3 separate experiments performed (C).

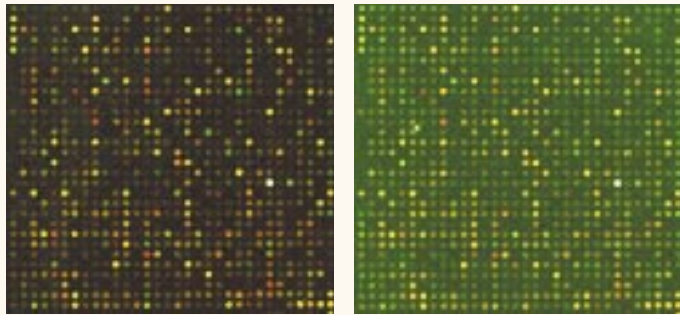


### Pronto!™ Background Reduction Kit

The Pronto!™ Background Reduction Kit is designed to eliminate background autofluorescence and prepare printed arrays for hybridization. It also can be used as the final step in the array fabrication process. The strong reducing effect of this treatment leads to increased sensitivity and specificity by removing autofluorescent background due to oxidation. The kit includes 10 Pre-Soak Tablets and 1 L of Pre-Soak Solution which provides enough reagents for the treatment of at least 50 arrays.

#### Pronto! Background Reduction Kit Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Case
40029	Pronto! Background Reduction Kit	1	1



With Presoak
Without Presoak

**Detect Low Expressing Genes**

Use of the Pronto! Background Reduction Kit results in the increased detection of low expressing genes (see table). Reduction of background autofluorescence is evident when 4K human arrays were processed using the presoak reagents in the Pronto! Background Reduction Kit. Arrays that were processed with the presoak reagents (left image) had a lower background detection cutoff than those processed without presoak (right image).

	With Presoak	Without Presoak
Background cutoff (RFU)	100.6	183.3
Number of features ≥ 2X background	1221	891

### Hybridization Chambers



Corning® Hybridization Chambers are designed to hold microarray slides (25 x 75 mm) at constant humidity during hybridization incubations. The O-ring and retaining clips ensure that the reusable chambers remain watertight when submerged in waterbaths and airtight in hybridization ovens. Wells in the base hold 10 to 15 µL of water to maintain optimal interior humidity.

The original Corning Hybridization Chamber (Cat. No. 2551) provides the ideal interior height and volume for use with one slide of the standard 1 mm thickness and a standard coverglass. The Corning Hybridization Chamber II (Cat. No. 40080) has an increased interior depth which not only allows for single slide hybridizations, but also allows the user to place two arrays face-to-face and hybridize using a single labeled target. This chamber can also be used with raised-edge cover-slips (Erie Scientific M-Series Lifter Slips™) that are thicker or taller than standard thin coverglass.

#### Hybridization Chambers Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Case
2551	Hybridization Chamber	1	5
40080	Hybridization Chamber II with Increased Depth	1	5
40001	Replacement O-rings (fit both chambers)	5	5



### Corning® Cover Glass

Corning Cover Glass is manufactured from special, optically clear glass. The cover glass is resistant to surface attack or weathering and will remain clear for extended periods of time. The flatness is controlled by a machine process resulting in a trouble-free fit to slides for a wettable and bubble-free mount.

The thickness of No. 1½ cover glass is 0.16 to 0.19 mm. Cover glass is packaged in plastic boxes for protection and convenience. Cover glasses in sizes and thicknesses other than those listed are available.

#### Cover Glass Ordering Information

Cat. No.	Description	Approx. Pcs/Oz	Qty/Case
2870-22	Corning Cover Glass, Square, 22 x 22 mm, No. 1½	135	10 oz
2940-223	Corning Cover Glass, Rectangular, 22 x 30 mm, No. 1½	97	10 oz
2940-224	Corning Cover Glass, Rectangular, 22 x 40 mm, No. 1½	73	10 oz
2940-225	Corning Cover Glass, Rectangular, 22 x 50 mm, No. 1½	58	10 oz
2940-243	Corning Cover Glass, Rectangular, 24 x 30 mm, No. 1½	89	10 oz
2940-244	Corning Cover Glass, Rectangular, 24 x 40 mm, No. 1½	67	10 oz
2940-245	Corning Cover Glass, Rectangular, 24 x 50 mm, No. 1½	54	10 oz
2940-246	Corning Cover Glass, Rectangular, 24 x 60 mm, No. 1½	45	10 oz





## Liquid Handling

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## Overview

### DESIGNED FOR PERFORMANCE

Corning Life Sciences offers a full line of liquid handling products that are manufactured under strict process controls guaranteeing consistent product performance. All Corning Life Sciences plastics manufacturing facilities are ISO 9002 registered. ISO registration is recognized worldwide as a standard of excellence for quality systems.

In addition, customers can now request a Certificate of Quality for any Corning® or Costar® liquid handling product. This certificate details lot-specific information on component materials, sterility testing and pyrogen testing. Also available are detailed product descriptions and drawings that highlight product dimensions and testing procedures. All are available simply by calling your local Corning Life Sciences office.

### NONPYROGENIC CERTIFICATION

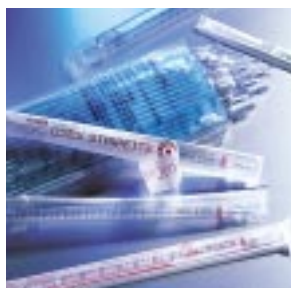
Most Corning and Costar liquid handling products are certified non-pyrogenic with a documented endotoxin level of equal to or less than 0.1 EU/mL. Endotoxins have been shown to cause variability in cell culture. Nonpyrogenic certification is another way Corning helps ensure consistent cell culture results. Corning also offers a detailed technical bulletin on the effects of endotoxins in cell culture. This may be obtained by calling your local Corning Life Sciences office or by downloading the bulletin from the Corning web site [www.corning.com/lifesciences](http://www.corning.com/lifesciences).



## Pipets



Stripette Serological Pipets



Three packaging options



Exclusive Antidrip Tip

### Stripette® Serological Pipets

- ▶ Stripette pipets are sterile, nonpyrogenic, and DNase-/RNase-free.
- ▶ Exclusive antidrip tip assures accurate delivery.
- ▶ Color-coded magnifier stripes make volume reading easier.
- ▶ Bidirectional graduations provide choice of ascending and descending scales
- ▶ Negative graduations allow additional working volume.
- ▶ Four packaging options:
  - Individually wrapped, clear plastic
  - Individually wrapped, paper/plastic
  - Bulk packed for large-scale sterile and nonsterile liquid handling applications
  - Clean room packed; individually wrapped, paper/plastic, triple bagged

### Stripette Pipets Ordering Information

Cat. No.	Capacity (mL)	Graduations (mL)	Negative Grads. (mL)	Color Coded Stripe	Qty/Pk	Qty/Cs
<i>Individually Wrapped, Clear Plastic Wrap</i>						
4011	1	1/100	0.2	Yellow	100/bag	1,000
4012	1	1/100	0.2	Yellow	100/bag	200
4021	2	1/100	0.2	Green	100/bag	1,000
4051	5	1/10	2.5	Blue	50/bag	200
4101	10	1/10	3.0	Orange	50/bag	200
4492*	10	1/10	3.0	Orange	50/bag	200
4251	25	2/10	10.0	Red	50/bag	200
4501	50	1/2	10.0	Purple	25/bag	100
4484	100	1	N/A	Aqua	10/bag	100
<i>Individually Wrapped, Paper/Plastic Wrap</i>						
4485	1	1/100	0.2	Yellow	50/bag	1,000
4486	2	1/100	0.2	Green	50/bag	1,000
4487	5	1/10	2.5	Blue	50/bag	200
4488	10	1/10	3.0	Orange	50/bag	200
4489	25	2/10	10.0	Red	25/bag	200
4490	50	1/2	10.0	Purple	25/bag	100
4491	100	1/1	N/A	Aqua	10/bag	100
<i>Bulk Packed in Bags</i>						
4010	1	1/100	0.2	Yellow	50/bag	1,000
4020	2	1/100	0.2	Green	50/bag	1,000
4050	5	1/10	2.5	Blue	50/bag	500
4100	10	1/10	3.0	Orange	50/bag	500
4250	25	2/10	10.0	Red	25/bag	200
4500	50	1/2	10.0	Purple	25/bag	100
<i>Clean Room Pack, Individually Wrapped, Paper/Plastic, Triple Bagged</i>						
7015	10	1/10	3.0	Orange	50/bag	200
7016	25	2/10	10.0	Red	25/bag	200
7017	50	1/2	10.0	Purple	25/bag	100
7000	100	1/1	N/A	Aqua	10/bag	100

\*Cat. No. 4492 features a wide tip for handling viscous fluids.



Aspirating Pipets

### Aspirating Pipets

Aspirating pipets are sterile, ungraduated and unplugged polystyrene pipets for aspirating liquid using vacuum suction.

#### Aspirating Pipets Ordering Information

Cat. No.	Volume (mL)	Qty/Pk	Qty/Cs
4975	1	50	1,000
9186	2	Individual	1,000
9099	5	Individual	200

## Pipetting Aids



Stripettor Pipetting Aid

### Stripettor Pipetting Aids

- ▶ Lightweight, adjustable speed control, and designed for use with all serological pipets
- ▶ Nose cones are autoclavable and have a replaceable 0.2 µm hydrophobic sterilizing filter
- ▶ Operates on a rechargeable 9V nickel hydride battery and features an LED light on the handle that lets the user know when to recharge
- ▶ Unit is fully operational while recharging

#### Stripettor Pipetting Aid Ordering Information

Cat. No.	Product Description	Qty/Cs
4910	Stripettor with sterile filter, rechargeable battery and recharger/adaptor	1
4911	Grommet replacement (silicone pipet holder)	1
4922	0.2 µm hydrophobic replacement filter	4
4923	0.2 µm hydrophobic replacement filter	25
4914	Recharger/adaptor for 4910	1

## Pipettors



Lambda Single Channel Pipettor

### Lambda® Single Channel Pipettor

- ▶ Corning® Lambda pipettors have a contoured handgrip and hook-style hand rest for greater comfort and less fatigue during prolonged use
- ▶ Quick-turn volume adjustment knob and easy-to-read digital volume display make volume selection easier
- ▶ Volume ranges include 0.1 to 2 µL, 0.5 to 10 µL, 2 to 20 µL, 10 to 100 µL, 20 to 200 µL, and 100 to 1000 µL
- ▶ Lower unit is autoclavable
- ▶ Backed by a three-year warranty

#### Lambda Single Channel Pipettor Ordering Information

Cat. No.	Volume Range (µL)	Qty/Cs
4959	0.1-2.0	1
4960	0.5-10	1
4961	2-20	1
4962	10-100	1
4963	20-200	1
4964	100-1,000	1
4958	Pipettor Stand	1



8 and 12-Pette Multichannel Pipettors

### 8-Pette® and 12-Pette® Multichannel Pipettors

- ▶ Costar® 8-Pette and 12-Pette multichannel pipettors feature a unique, ergonomic trigger-style aspiration and dispense control mechanism designed to reduce thumb fatigue during repetitive pipetting
- ▶ Volume range is 20 to 200 µL
- ▶ Volume is adjusted with a vernier-scale spindle
- ▶ Pipettors are entirely autoclavable

#### 8-Pette and 12-Pette Multichannel Pipettors Ordering Information

Cat. No.	Volume Range (µL)	Channels	Qty/Cs
4880	20-200	12	1
4888	20-200	8	1

### Octapette® Multichannel Pipettors

- ▶ Costar® Octapette pipettors have 8 fixed-volume channels
- ▶ Available in 25, 50, 100, and 200 µL dispensing volumes

#### Octapette Multichannel Pipettors Ordering Information

Cat. No.	Volume (µL)	Channels	Color Code	Qty/Cs
4825	25	1-8	Yellow	1
4850	50	1-8	Green	1
4800	100	1-8	Orange	1
4820	200	1-8	Blue	1



Octapette Multichannel Pipettors

## Pipet Tips



Universal Fit Pipet Tips

### Universal Fit 200 and 1000 µL Pipet Tips

- ▶ Corning® universal fit tips are designed to provide a reliable fit with all major brand pipettors. (A Pipet Tip Compatibility Guide can be requested or downloaded from the Corning website.)
- ▶ Beveled orifice helps ensure accurate fluid delivery
- ▶ 1-200 µL universal fit tips are graduated at the 10, 50, and 100 µL volumes
- ▶ Select from three packaging options:
  - Racked tips are certified RNase-/DNase-free and nonpyrogenic
  - Stack rack tips feature a stack of five racks, each containing 96 tips, for a total of 480 tips in a space-saving design
  - Bulk packed tips are nonsterile and very economical

#### Universal Fit 200 and 1,000 µL Pipet Tips Ordering Information

Cat. No.	Volume Range (µL)	Format	Color	Sterile	Racks/Cs	Tips/Cs
<i>Racked Tips</i>						
4860	1-200	96 Tips/Rack	Yellow	Yes	10	960
4863	1-200	96 Tips/Rack	Natural	No	10	960
4864	1-200	96 Tips/Rack	Natural	Yes	10	960
4865	1-200	96 Tips/Rack	Yellow	No	10	960
4956	1-300	96 Tips/Rack	Natural	Yes	10	960
4867	100-1,000	100 Tips/Rack	Blue	No	10	1,000
9032	100-1,000	100 Tips/Rack	Blue	Yes	10	1,000

## Universal Fit 200 and 1000 $\mu$ L Pipet Tips (Continued)

### Universal Fit 200 and 1,000 $\mu$ L Pipet Tips Ordering Information

Cat. No.	Volume Range ( $\mu$ L)	Format	Color	Sterile	Racks/Cs	Tips/Cs
<i>Stack Rack Tips</i>						
4803	1-200	480 Tips/Stack Rack	Natural	No	10	4,800
4804	1-200	480 Tips/Stack Rack	Natural	Yes	10	4,800
4806	1-200	480 Tips/Stack Rack	Natural	No	2	960
<i>Bulk Packed Tips</i>						
4844	1-200	Bulk Pack	Natural	No	1,000	10,000
4845	1-200	Bulk Pack	Yellow	No	1,000	10,000
4862	1-200	Bulk Pack	Natural	No	1,000	1,000
4866	1-200	Bulk Pack	Yellow	No	1,000	1,000
4846	100-1,000	Bulk Pack	Blue	No	1,000	10,000
4868	100-1,000	Bulk Pack	Blue	No	1,000	1,000



Universal Fit Pipet Tips

### Smart Rack Pipet Tip Refill System

- ▶ Corning® Smart Rack makes refilling pipet tip racks easier than ever
- ▶ Tips are contained on an autoclavable plastic reload card and transferred to a rack with a disposable reloading device (included)
- ▶ Compatible with many popular brand 200  $\mu$ L 96-tip racks
- ▶ Two configurations are available – 94-tip and 96-tip. In the 94-tip configuration, each reload card contains 94 tips and two corner anchoring pins that secure the card to the rack
- ▶ The 96-tip configuration does not include the corner anchoring pins.
- ▶ Smart Rack tips are nonsterile, autoclavable, RNase-/DNase-free, nonpyrogenic, and DNA-free

### Smart Rack Pipet Tip Refill System Ordering Information

Cat. No.	Tip Volume ( $\mu$ L)	Color	Tips/Pack	Packs/Cs	Tips/Cs
4786	200	Natural	940	5	4,700
4787	200	Natural	960	5	4,800



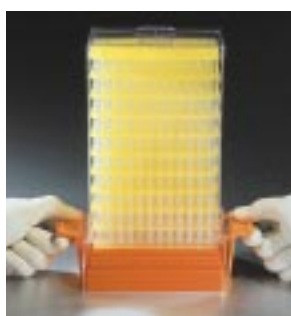
Smart Rack Pipet Tip Refill System

### Pipet Tip Loading System

- ▶ The Corning pipet tip loading system makes reloading racks economical and effortless
- ▶ The system consists of a one-piece base that attaches to a “magazine” consisting of 10 layers of 96 tips
- ▶ Simply place the loader and magazine over an empty rack, lower the magazine, and “click” – the rack is loaded and ready for use

### Pipet Tip Loading System Ordering Information

Cat. No.	Description
4780	Starter Kit, natural 1-200 $\mu$ L tips; includes 1 tip loader, 1 magazine with 960 tips and 10 empty racks
4781	Starter Kit, yellow 1-200 $\mu$ L tips; includes 1 tip loader, 1 magazine with 960 tips and 10 empty racks



Pipet Tip Loading System

### Pipet Tip Loading System Refill Magazines

- ▶ Tip loading system refills consist of magazines containing 10 layers of 96 tips
- ▶ Each magazine refills 10 racks

### Pipet Tip Loading System Refill Magazines Ordering Information

Cat. No.	Tip Volume ( $\mu$ L)	Color	Tips/Magazine	Magazines/Cs	Tips/Cs
4783	1-200	Natural	960	5	4,800
4785	1-200	Yellow	960	5	4,800



IsoTip Filtered Pipet Tips

### IsoTip™ Filtered Pipet Tips

- ▶ IsoTip filtered pipet tips feature an inert, hydrophobic barrier that prevents aerosolized contaminants from coming in contact with pipettor shafts
- ▶ Ideal for applications where avoiding cross contamination is critical, such as DNA amplification and radioisotope handling
- ▶ Packaged sterile
- ▶ Certified RNase-/DNase-free and nonpyrogenic
- ▶ The IsoTip plus tips (Cat. No. 4810) are designed for use with 2 to 20 µL, 10 to 100 µL, and 20 to 200 µL pipettors, eliminating the need to stock three different filter tips
- ▶ A Pipet Tip Compatibility Guide can be requested or downloaded from the Corning website.

#### IsoTip Filtered Pipet Tips Ordering Information

Cat. No.	Volume Range (µL)	Precise Fit	Tips/Rack	Racks/Cs	Tips/Cs
4801	0.1-2.0	Gilson® and other popular ultra-micropipettors	96	10	960
4807	0.2-10	Gilson and other popular ultra-micropipettors	96	10	960
4808	0.5-10	Eppendorf® and other popular ultra-micropipettors	96	10	960
4821	1-30	All popular research-grade pipettors	96	10	960
4823	1-200	All popular research-grade pipettors	96	10	960
4810	1-200	All popular research-grade pipettors	96	10	960
4809	100-1,000	All popular research-grade pipettors	100	10	1,000

### 1 to 200 µL Gel-Loading Pipet Tips

- ▶ Corning® gel-loading pipet tips feature a capillary end that allows easy access into vertical and horizontal electrophoresis gels
- ▶ Total capacity of 200 µL
- ▶ Certified RNase-/DNase-free and nonpyrogenic
- ▶ Tips are 83 mm in length

#### 1 to 200 µL Gel-Loading Pipet Tips Ordering Information

Cat. No.	Tip Shape	End Thickness (mm)	Sterile	Tips/Rack	Racks/Cs	Tips/Cs
4853	Round	0.5	No	200	2	400
4854	Flat	0.4	No	200	2	400
4884	Flat	0.2	No	200	2	400

### Microvolume Gel-Loading Pipet Tips

- ▶ Corning microvolume gel-loading tips feature a capillary end for gel-loading and are designed for use with Gilson and other popular ultra-micropipettors
- ▶ Working volume of 0.2 to 10 µL
- ▶ Certified RNase-/DNase-free and nonpyrogenic

#### Microvolume Gel-Loading Pipet Tips Ordering Information

Cat. No.	Tip Shape	End Thickness (mm)	Sterile	Tips/Rack	Racks/Cs	Tips/Cs
4815	Flat	0.2	No	200	2	400



Gel-Loading Pipet Tips and Microvolume Gel-Loading Pipet Tips





Microvolume Pipet Tips

### Microvolume Pipet Tips

- ▶ Microvolume tips provide accurate, reliable performance in the 0.1-10  $\mu\text{L}$  range for major brand ultra-micropipettors
- ▶ All racked tips are certified RNase-/DNase-free and nonpyrogenic

#### Microvolume Pipet Tips Ordering Information

Cat. No.	Volume Range ( $\mu\text{L}$ )	Fit	Sterile	Qty/Pk	Tips/Cs
4826	0.1-10	Gilson® and other popular ultra-micropipettors	No	96/rack	960
4894	0.1-10	Gilson and other popular ultra-micropipettors	Yes	96/rack	960
4840	0.1-10	Gilson and other popular ultra-micropipettors	No	1,000/bag	10,000
4830	0.5-10	Eppendorf® and other popular ultra-micropipettors	Yes	96/rack	960
4834	0.5-10	Eppendorf and other popular ultra-micropipettors	No	96/rack	960
4901	0.5-10	Eppendorf and other popular ultra-micropipettors	No	1,000/bag	10,000

## Reagent Reservoirs

4870 and 4871  
50 mL Reagent Reservoir4872 and 4873  
100 mL Reagent Reservoir

Costar® Reagent Reservoirs are ideal for repetitively filling multichannel pipettors

- ▶ Manufactured from modified polystyrene
- ▶ Sterile
- ▶ Disposable

#### Reagent Reservoirs Ordering Information

Cat No.	Volume (mL)	Color	Qty/Pk	Qty/Cs
4870	50	Natural	5/bag	200
4871	50	Natural	1/bag	100
4872	100	White	5/bag	200
4873	100	White	1/bag	100

## Transtar-96® Well Liquid Transfer System



Transtar-96 System

- ▶ The Costar Transtar-96 System is a portable, autoclavable liquid handling device for use with 96 well plates
- ▶ A sterile 96 tip disposable cartridge, which loads into the Transtar system, enables liquids to be aspirated, transferred and dispensed over a volume range of 25 to 200  $\mu\text{L}$  in 5  $\mu\text{L}$  increments
- ▶ The Transtar-96 System is ideal for changing cell culture media and screening monoclonal antibodies
- ▶ Transtar-96 System accuracy is rated at  $\pm 5\%$  at all volume levels

#### Transtar-96 Well Liquid Transfer System Ordering Information

Cat. No.	Description	Sterile	Qty/Pk	Qty/Cs
7605	Transtar-96, adjustable-volume pipettor	N/A	1	1
7606	Transtar elevator	N/A	1	1
7610	Transtar disposable cartridges	Yes	1	24
4876	Transtar disposable reservoir liner, open	Yes	1	100
4877	Transtar disposable reservoir liner, 12-channel	Yes	1	100
4878	Transtar disposable reservoir liner, 8-channel	Yes	1	100



Transtar Disposable Cartridge

## Aspirator



Aspirator

The Costar® aspirator is an aspirating device for safe liquid removal/disposal from a variety of laboratory vessels using standard disposable pipet tips

### Aspirator Ordering Information

Cat. No.	Description
4930	Aspirator device (includes hand piece, grommet for accessory attachment, and single-channel adapter for use with disposable pipet tips)
4931	8-channel adapter for use with disposable pipet tips

## Vacuum Filters

Corning offers a variety of filter systems, membranes, pore sizes, and materials. For help in selecting the best filter combination for your research, please refer to the Technical Appendix for *Selecting the Best Filter for Your Application* on page 117.

### 115 mL Vacuum Filters

- ▶ 60 mm diameter membrane
- ▶ Low center of gravity and wide base for stability
- ▶ Separate pour spout to remove filtered sample which minimizes contamination
- ▶ Individually packaged, sterile, certified nonpyrogenic



Vacuum Filter

### 115 mL Vacuum Filters Ordering Information

Cat. No.	Membrane	Volume (mL)	Pore Size (µm)	Qty/Cs
430944	CA	115	0.22	24
430945	CA	115	0.45	24

CA = Cellulose Acetate

### 150 mL Tube Top Vacuum Filters

- ▶ 50 mm diameter membrane
- ▶ Minimizes unnecessary transfers by filtering directly into 50 mL centrifuge tube
- ▶ Includes two centrifuge tube stands with each case
- ▶ Each polypropylene centrifuge tube is supplied with an individually wrapped cap for storage
- ▶ Individually packaged, sterile, certified nonpyrogenic



Tube Top Vacuum Filter

### 150 mL Tube Top Vacuum Filters Ordering Information

Cat. No.	Membrane	Funnel Size/ Tube Size (mL)	Pore Size (µm)	Qty/Cs
430314	CA	150/50	0.45	12
430320	CA	150/50	0.22	12

CA = Cellulose Acetate



Vacuum Filter Systems

### Vacuum Filter Systems

- ▶ Four sizes: 150 mL; 250 mL, 500 mL, and 1 L
- ▶ Adapters are color coded by membrane type for easy product identification
- ▶ Angled hose connector simplifies vacuum line attachment
- ▶ Receiver bottles feature easy grip sides for improved handling
- ▶ Individually packaged, sterile, certified nonpyrogenic
- ▶ Caps for receiver bottles are sterile and individually packaged
- ▶ Extra plastic storage bottles are available, see page 109

### Vacuum Filter Systems Ordering Information

Cat. No.	Membrane	Funnel/Bottle Volume (mL)	Pore Size (µm)	Color-Coded Adapter	Qty/Cs
<i>150 mL Capacity, 50 mm Diameter Membrane</i>					
431153	PES	150/150	0.22	Yellow	12
431154	CA	150/150	0.22	Orange	12
431155	CA	150/150	0.45	Orange	12
<i>250 mL Capacity, 50 mm Diameter Membrane</i>					
430756	CN	250/250	0.2	Blue	12
430767	CA	250/250	0.22	Orange	12
430768	CA	250/250	0.45	Orange	12
430771	NY	250/250	0.2	Red	12
431096	PES	250/250	0.22	Yellow	12
<i>500 mL Capacity, 70 mm Diameter Membrane</i>					
430758	CN	500/500	0.2	Blue	12
430769	CA	500/500	0.22	Orange	12
430770	CA	500/500	0.45	Orange	12
430773	NY	500/500	0.2	Red	12
431097	PES	500/500	0.22	Yellow	12
<i>1,000 mL Capacity, 90 mm Diameter Membrane</i>					
430186	CN	1,000/1,000	0.2	Blue	12
430515	NY	1,000/1,000	0.2	Red	12
430516	CA	1,000/1,000	0.45	Orange	12
430517	CA	1,000/1,000	0.22	Orange	12
431098	PES	1,000/1,000	0.22	Yellow	12
431205*	CA	500*/1,000	0.22	Orange	12
431206*	CA	500*/1,000	0.45	Orange	12

\*500 mL Funnel with 70 mm membrane.

PES = Polyethersulfone, CA = Cellulose Acetate, CN = Cellulose Nitrate, NY = Nylon.



Bottle Top Vacuum Filters

### Bottle Top Vacuum Filters

- ▶ Available in 33 mm and 45 mm neck sizes to fit most glass and plastic media storage bottles
- ▶ 45 mm neck sizes fit on Corning® plastic storage bottles, see page 109
- ▶ Adaptors are color coded by membrane type
- ▶ Individually packaged, sterile and certified nonpyrogenic

### Bottle Top Vacuum Filters Ordering Information

Cat. No.	Membrane	Volume (mL)	Neck Size (mm)	Pore Size (µm)	Color-Coded Adapter	Qty/Cs
<i>150 mL Capacity, 50 mm Diameter Membrane</i>						
430624	CA	150	33	0.22	Orange	48
430625	CA	150	33	0.45	Orange	48
430626	CA	150	45	0.22	Orange	48
430627	CA	150	45	0.45	Orange	48
431160	PES	150	33	0.22	Yellow	48
431161	PES	150	45	0.22	Yellow	48
<i>500 mL Capacity, 70 mm Diameter Membrane</i>						
430049	NY	500	45	0.2	Red	12
430512	CA	500	33	0.45	Orange	12
430513	CA	500	45	0.22	Orange	12
430514	CA	500	45	0.45	Orange	12
430521	CA	500	33	0.22	Orange	12
431117	PES	500	33	0.22	Yellow	12
431118	PES	500	45	0.22	Yellow	12
<i>1,000 mL Capacity, 90 mm Diameter Membrane</i>						
430015	CA	1,000	45	0.22	Orange	12
431174	PES	1,000	45	0.22	Yellow	12

PES = Polyethersulfone, CA = Cellulose Acetate, CN = Cellulose Nitrate, NY = Nylon.

## Syringe Filters



µStar Syringe Filters

### µStar® Syringe Filters

- ▶ Costar® µStar syringe filters have a bidirectional flow pattern that eliminates the priming and air lock effects of conventional syringe tip filters
- ▶ Cellulose acetate membrane in a polyvinyl chloride (PVC) housing
- ▶ Utilizes all of the membrane surface area for a working volume up to 100 mL while minimizing fluid retention to less than 30 µL with an air purge
- ▶ Integrity tested with a maximum operating pressure of 100 psi, the µStar filter, a Class II medical device, is designed for sterilization and clarification of aqueous solutions including: media additives, serum, antibiotics, biological fluids, radioactive tracers, and virus suspensions
- ▶ Sterile, certified nonpyrogenic

### µStar Syringe Filters Ordering Information

Cat. No.	Membrane	Color	Pore Size (µm)	Qty/Cs
8110	CA	Blue	0.22	50
8112	CA	Clear	0.45	50

CA = Cellulose Acetate



Syringe Filters

## Syringe Filters

- ▶ Corning® syringe filters are 100% integrity tested, are certified nonpyrogenic and noncytotoxic, and are manufactured in accordance with ISO 9002 standards
- ▶ A variety of membranes are available to meet your needs: PES for low protein binding and faster flow rates; surfactant-free cellulose acetate (SFCA) for the lowest protein binding; PTFE for chemical resistance; and regenerated cellulose (RC), the best choice for DMSO compatibility

### Syringe Filters Ordering Information

Cat. No.	Diameter (mm)	Pore Size (µm)	Membrane Material	Housing Material	Sterile	Inlet/Outlet	Packaging	Qty/Cs
431212	4	0.2	RC	PP	Yes	LL/LS	Ind	50
431215	15	0.2	RC	PP	Yes	LL/LS	Ind	50
431218	26	0.2	SFCA-PF	AC	Yes	LL/LS	Ind	50
431219	26	0.2	SFCA	AC	Yes	LL/LS	Ind	50
431220	26	0.45	SFCA	AC	Yes	LL/LS	Ind	50
431221	26	0.8	SFCA	AC	Yes	LL/LS	Ind	50
431222	25	0.2	RC	PP	Yes	LL/LS	Ind	50
431224	25	0.2	NY	PP	Yes	LL/LS	Ind	50
431225	25	0.45	NY	PP	Yes	LL/LS	Ind	50
431227*	50	0.2	PTFE	PP	Yes	HB/HB	Ind	12
431229	26	0.2	PES	AC	Yes	LL/LS	Ind	50
431231	25	0.45	PTFE	PP	No	LL/LS	Bulk	50

PP = Polypropylene, AC = Acrylic Copolymer, LL = Luer Lock/Female, LS = Luer Slip/Male, HB = Hose Barb, NY = Nylon, PES = Polyethersulfone, PTFE = Teflon, RC = Regenerated Cellulose, SFCA = Surfactant Free Cellulose Acetate, SFCA-PF = Surfactant Free Cellulose Acetate with Prefilter.

\*Recommended as in-line air filter.

## Spin-X® Centrifuge Tube Filters



Spin-X Centrifuge Tube Filters

- ▶ Costar® Spin-X centrifuge tube filters consist of a membrane-containing filter unit within a centrifuge tube.
- ▶ Uses:
  - Removing bacteria, cells and particles from liquids
  - HPLC sample preparation
  - DNA removal from agarose or acrylamide gels. Maximum RCF (Relative Centrifugal Force [x g]) is 16,000

### Spin-X Centrifuge Tube Filters Ordering Information

Cat. No.	Membrane Material	Working Volume (µL)	Pore Size (µm)	Sterile	Tube Size (mL)	Qty/Cs
8160	CA	500	0.22	Yes	2.0	96
8161	CA	500	0.22	No	2.0	100
8162	CA	500	0.45	Yes	2.0	96
8163	CA	500	0.45	No	2.0	100
8169	NY	500	0.22	No	2.0	200
8170	NY	500	0.45	No	2.0	200

CA = Cellulose Acetate, NY = Nylon.

## Storage Bottles



- ▶ Disposable polystyrene bottles for storage of media, buffers and other aqueous solutions
- ▶ Two styles:
  - Low profile, easy grip style has sides that facilitate handling
  - Traditional style has smooth sides
- ▶ Plug seal caps (45 mm) provide an airtight seal and help minimize the risk of contamination.
- ▶ Bottles can be used with Corning® Vacuum Filter Systems
- ▶ Sterile, certified nonpyrogenic



### Corning® Easy Grip Style Storage Bottles Ordering Information

Cat. No.	Volume (mL)	Neck Size (mm)	Qty/Pk	Qty/Cs
431175	150	45	2	24
430281	250	45	2	24
430282	500	45	2	24
430518	1,000	45	2	24

### Costar® Traditional Style Storage Bottles Ordering Information

Cat. No.	Volume (mL)	Neck Size (mm)	Qty/Pk	Qty/Cs
8388	125	45	1	24
8390	250	45	1	12
8393	500	45	1	12
8396	1,000	45	1	12

## Containers



- ▶ Flexible polypropylene bottom with snap-on polyethylene lid serves as a beaker or storage container.
- ▶ Graduated in both milliliters and ounces
- ▶ Certified nonpyrogenic

### Containers Ordering Information

Cat. No.	Description	Sterile	Capacity (mL)	Qty/Pk	Qty/Cs
430179	Container and Lid	Yes	250	1	100
430180	Container Only	Yes	250	20	500
430181	Lid Only	Yes	n/a	20	500

## Cylinder



- ▶ Corning optically clear polystyrene graduated cylinder is designed for sterile, accurate dispensing of culture media or other biological fluids
- ▶ A polyethylene dust cover is included

### Cylinder Ordering Information

Cat. No.	Capacity (mL)	Graduation (mL)	Sterile	Qty/Pk	Qty/Cs
430182	100	1	Yes	1	50



## Erlenmeyer Flasks



1L Erlenmeyer Flask

### Shaker Flask Application Tip

Corning recommends starting with a shaking rate of 75-125 RPM (orbital shaker) and a medium volume of 30-40% of the nominal flask capacity.



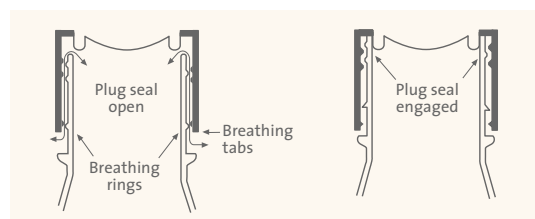
431255 2L Erlenmeyer Flask



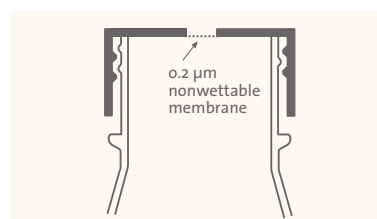
431252 3L Fernbach Culture Flask

### Polycarbonate Erlenmeyer Flasks

- ▶ Made from optically clear polycarbonate
- ▶ Ideal for shaker culture applications
- ▶ Two-position polypropylene plug seal caps can be open for gas exchange or closed for liquid-tight seal
- ▶ Vent caps available for applications requiring sterile gas exchange
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic



Breathable two-position plug seal caps feature one-piece linerless construction with a flexible plug for a gas- and liquid-tight seal. In addition, the unique breathable cap design allows use in either an open or closed mode.



Vent caps contain a 0.2 µm nonwetable membrane sealed to the cap, providing consistent, sterile gas exchange while minimizing the risk of contamination.

### Polycarbonate Erlenmeyer Flasks Ordering Information

Cat. No.	Capacity (mL)	Graduation (mL)	Neck Diameter (mm)	Cap Style	Qty/Pk	Qty/Cs
430421	125	25	26	Plug Seal	1	50
431143	125	25	26	Vent Cap	1	50
430183	250	25	31	Plug Seal	1	50
431144	250	25	31	Vent Cap	1	50
430422	500	50	43	Plug Seal	1	25
431145	500	50	43	Vent Cap	1	25
431146	1,000	50	43	Plug Seal	1	25
431147	1,000	50	43	Vent Cap	1	25

### Polycarbonate 2L and 3L Flasks

- ▶ Made from optically clear polycarbonate
- ▶ Ideal for shaker and suspension culture applications
- ▶ Flasks are available with or without baffled bottoms
- ▶ Vent caps are available and feature a hydrophobic membrane for applications requiring sterile gas exchange
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

### Polycarbonate 2L and 3L Flasks Ordering Information

Cat. No.	Description	Sterile	Qty/Cs
431255	Erlenmeyer Flask, 2L, Polycarbonate	Yes	6
431256	Erlenmeyer Flask, 2L, Polycarbonate, Baffled Bottom	Yes	6
431252	Fernbach Culture Flask, 3L, Polycarbonate	Yes	4
431253	Fernbach Culture Flask, 3L, Polycarbonate, Baffled Bottom	Yes	4
431339	Cap, Vented, 48 mm for 2L Flask	Yes	24
431340	Cap, Vented, 70 mm for 3L Flask	Yes	24

## Spatulas



Spatulas

- ▶ Corning® spatulas are designed to save researcher's time and to provide them with contamination-free samples
- ▶ Each spatula is individually packaged, certified RNase-/DNase-free, nonpyrogenic, antistatic and sterile
- ▶ They are specifically targeted toward researchers interested in eliminating the recycling and resterilizing necessary with reusable spatulas
- ▶ Spatulas are available in five different configurations
- ▶ Microspatulas are available in 2 configurations

### Spatulas Ordering Information

Cat. No.	Description	Qty/Cs
3003	Spatula, Tapered Blade/Spoon	100
3004	Spatula, Small Spoon/Spoon	100
3005	Spatula, Round End/Spoon	100
3006	Spatula, V-Scoop/Spoon	100
3007	Spatula, Flat End/Spoon	100
3012	Microspatula, Tapered End/Scoop	50
3013	Microspatula, Rounded End/Scoop	50



Microspatulas

## Centrifuge Tubes



15 mL Centrifuge Tube

### 15 mL Centrifuge Tubes

- ▶ Corning 15 mL centrifuge tubes feature black printed graduations and a large white marking spot
- ▶ Available with your choice of cap styles; the original plug seal or flat cap
- ▶ Available in racks or bulk packed in ziplock, resealable sleeves
- ▶ Sterile, certified nonpyrogenic, and RNase-/DNase-free
- ▶ Foam racks also available separately

### Centrifuge Tubes Ordering Information

Cat. No.	Material	Cap Style	Max. RCF	Qty/Pk	Qty/Cs
430053	PET	Plug Seal	3,600	25/Sleeve	500
430055	PET	Plug Seal	3,600	50/Rack	500
430052	PP	Plug Seal	8,400	50/Rack	500
430766	PP	Plug Seal	8,400	25/Sleeve	500
430790	PP	Flat Top	8,400	50/Rack	500
430791	PP	Flat Top	8,400	25/Sleeve	500
431355	Foam Centrifuge Tube Rack, 15 mL				20

PP = Polypropylene, PET = Polyethylene Terephthalate, RCF = Relative Centrifugal Force (x g).



50 mL Centrifuge Tube

### 50 mL Centrifuge Tubes

- ▶ Corning® 50 mL centrifuge tubes feature black printed graduations and a large white marking spot
- ▶ Available with your choice of cap styles; the original plug seal or flat cap
- ▶ Available in racks or bulk packed in ziplock, resealable sleeves
- ▶ Sterile, certified nonpyrogenic, and RNase-/DNase-free
- ▶ Foam racks also available separately

#### 50 mL Centrifuge Tubes Ordering Information

Cat. No.	Material	Cap Style	Max. RCF	Qty/Pk	Qty/Cs
430290	PP	Plug Seal	9,400	25/Rack	500
430291	PP	Plug Seal	9,400	25/Sleeve	500
430304	PET	Plug Seal	3,600	25/Rack	500
430828	PP	Flat Top	9,400	25/Rack	500
430829	PP	Flat Top	9,400	25/Sleeve	500
4558	PP	CentriStar™ Cap	15,500	25/Universal Rack*	300
4365	Foam Centrifuge Tube Rack, 50 mL			–	20

PP = Polypropylene, PET = Polyethylene Terephthalate, RCF = Relative Centrifugal Force (x g).

\*New innovative universal rack can hold 50 mL and 15 mL tubes securely, allowing researchers to work with and store both size tubes in the same rack, saving bench and storage space.

### Self-Standing 50 mL Centrifuge Tubes

- ▶ All Corning 50 mL centrifuge tubes feature black printed graduations and a large white marking spot
- ▶ Available with your choice of cap styles; the original plug seal or flat cap
- ▶ Tubes are bulk packed in ziplock, resealable sleeves
- ▶ Sterile, certified nonpyrogenic, and RNase-/DNase-free

#### Self-Standing 50 mL Centrifuge Tubes Ordering Information

Cat. No.	Material	Cap Style	Max. RCF	Qty/Pk	Qty/Cs
430897	PP	Plug Seal	3,000	25	500
430921	PP	Flat Top	3,000	25	500

PP = Polypropylene, RCF = Relative Centrifugal Force (x g).



Self Standing 50 mL Centrifuge Tube

### 250 mL and 500 mL Centrifuge Tubes and Support Cushions

- ▶ Corning 250 mL and 500 mL polypropylene tubes are ideal for applications requiring large-volume centrifugation
- ▶ Each case of tubes contains a rack to facilitate handling
- ▶ Support cushions must be used with this product unless the rotor has appropriately shaped V-bottom holders
- ▶ Tubes are sterile and certified nonpyrogenic

#### 250 mL and 500 mL Centrifuge Tubes Ordering Information

Cat. No.	Description	Material	Cap Style	Max RCF	Qty/Pk	Qty/Cs
430776	250 mL Tube	PP	Plug	6000	6	102
430236	250 mL Support Cushion	PEI	n/a	n/a	n/a	6
431123	500 mL Tube	PP	Plug	6000	6	36
431124	500 mL Support Cushion	PEI	n/a	n/a	n/a	6

PP = Polypropylene, PEI = Polyetherimide, RCF = Relative Centrifugal Force (x g).



500 and 250 mL Centrifuge Tubes

## Microcentrifuge Tubes

Corning offers two styles of microcentrifuge tubes: traditional snap cap tubes for quick access or screw cap tubes for greater sealing security.



Microcentrifuge Tubes

### Snap Cap Polypropylene Microcentrifuge Tubes

- ▶ Costar® microcentrifuge tubes are certified RNase-/DNase-free
- ▶ Supplied nonsterile and are autoclavable
- ▶ External graduations and frosted writing spot for easy sample identification
- ▶ Positive seal design allows for repeated opening and closing
- ▶ Flat cap surface for convenient labeling
- ▶ Withstands a maximum RCF of 17,000 x g
- ▶ Costar low binding microcentrifuge tubes feature a bonded polymer technology that reduces protein and nucleic acid binding, resulting in better sample recovery

### Snap Cap Polypropylene Microcentrifuge Tubes Ordering Information

Cat. No.	Volume (mL)	Color	Qty/Pk	Qty/Cs
<i>Snap Cap Microcentrifuge Tubes</i>				
3208	0.65	Natural	500	1,000
3209*	0.65	Rainbow*	200	1,000
3620	1.7	Natural	500	500
3621	1.7	Natural	500	5,000
3622*	1.7	Rainbow*	100	500
3213	2.0	Natural	500	1,000
<i>Low Binding Snap Cap Microcentrifuge Tubes Ordering Information</i>				
3206	0.65	Natural	500	500
3207	1.7	Natural	250	250

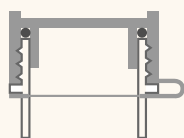
\*Rainbow pack includes one bag each of blue, green, yellow, red, and orange tubes.

### Screw Cap Polypropylene Microcentrifuge Tubes

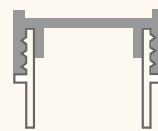
- ▶ Corning® polypropylene microcentrifuge tubes feature screw caps that provide a tight secure seal
- ▶ Choice of attached cap with silicone O-ring or unattached rim seal cap
- ▶ All tubes have a large white marking spot.
- ▶ Withstands a maximum RCF of 13,000 x g
- ▶ Sterile



Microcentrifuge Tubes



▶ Attached loop cap allows for optimum one-handed convenience. Silicone O-ring gasket provides a snug seal, safeguarding samples against leakage.






▶ Easy-to-use unattached rim seal cap design twists on or off in a single turn.

### Screw Cap Polypropylene Microcentrifuge Tubes Ordering Information

Cat. No.	Volume (mL)	Cap Style	O-ring	Self Standing	Qty/Cs
430909	1.5	Attached	Yes	No	500
430915	2.0	Attached	Yes	Yes	500
430917	2.0	Unattached	No	Yes	500

# Cryogenic Vials and Accessories

Corning offers three styles of cryogenic vials as well as storage racks and boxes.

 <p><b>External Thread Cryogenic Vial</b></p> <ul style="list-style-type: none"> <li>Color-coded polypropylene cap inserts simplify vial identification. Available in variety packs of white, blue, green, red, and yellow.</li> <li>Silicone washer provides a secure seal.</li> <li>Easy-to-read black graduations for partial volumes</li> <li>Self-standing base, self-locking skirt</li> </ul>	 <p><b>Internal Thread Cryogenic Vial</b></p> <ul style="list-style-type: none"> <li>Color-coded polypropylene cap inserts simplify vial identification. Available in variety packs of white, blue, green, red, and yellow.</li> <li>Silicone washers or rubber O-rings provide a secure seal.</li> <li>Easy-to-read black graduations for partial volumes</li> <li>Self-standing base, self-locking skirt</li> </ul>	 <p><b>External Thread Plug Seal Cap</b></p> <ul style="list-style-type: none"> <li>Sure-grip plug seal screw cap</li> <li>Inner cap ring assures a tight seal.</li> </ul>
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External Thread Cryogenic Vials

## External Thread Cryogenic Vials

- Manufactured from polypropylene to withstand temperatures down to -196°C
- Larger marking spot
- Black graduations
- Certified RNase-/DNase-free
- Vials have a silicone washer for a secure seal.
- Vials may be color coded with inserts (see page 116)
- Self-standing vials have a special base design allowing them to be locked into cryogenic rack and tray (Cat. No. 430525 or 431131) for single-handed manipulation
- Sterilized by gamma radiation
- Certified nonpyrogenic
- Free foam rack with each case

### Cryogenic Vial Safety Tip

Appropriate safety equipment (gloves, face shields, biological safety cabinets, hoods, etc.) should always be used to protect personnel when removing vials or ampules from cryogenic storage systems.

### External Thread Cryogenic Vials Ordering Information

Cat. No.	Capacity (mL)	Style	Self-Standing	Qty/Pk	Qty/Cs
430658	1.2	Conical Bottom	Yes	50	500
430659	2.0	Round Bottom	Yes	50	500
430661	2.0	Round Bottom	No	50	500
430662	4.0	Round Bottom	Yes	50	500
430663	5.0	Round Bottom	Yes	50	500

**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.



Internal Thread Cryogenic Vials

### Internal Thread Cryogenic Vials

- ▶ Manufactured from polypropylene to withstand temperatures down to  $-196^{\circ}\text{C}$
- ▶ Larger marking spot
- ▶ Black graduations
- ▶ Certified RNase-/DNase-free
- ▶ Vials have a silicone washer or rubber O-ring for a secure seal
- ▶ Vials may be color coded with inserts (see page 116)
- ▶ Self-standing vials have a special base design allowing them to be locked into cryogenic rack and tray (Cat. No. 430525 or 431131) for single-handed manipulation
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic
- ▶ Free foam rack with each case

### Internal Thread Cryogenic Vials Ordering Information

Capacity Cat. No.	(mL)	Style	Self- Standing	Seal Type	Qty/Pk	Qty/Cs
430487	1.2	Conical Bottom	Yes	Washer	50	500
2012	1.2	Conical Bottom	Yes	O-Ring	50	250
430488	2.0	Round Bottom	Yes	Washer	50	500
430489	2.0	Round Bottom	No	Washer	50	500
2027	2.0	Round Bottom	No	O-Ring	50	250
2028	2.0	Round Bottom	Yes	O-Ring	50	250
430490	4.0	Round Bottom	No	Washer	50	500
430491	4.0	Round Bottom	Yes	Washer	50	500
430492	5.0	Round Bottom	No	Washer	50	500
430656	5.0	Round Bottom	Yes	Washer	50	500
2051	5.0	Round Bottom	No	O-Ring	50	250

**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.

### External Thread Cryogenic Vials with Plug Seal Cap

- ▶ Manufactured from polypropylene to withstand temperatures down to  $-196^{\circ}\text{C}$
- ▶ Vials feature an external thread with a traditional plug seal cap design for a secure seal
- ▶ Cap does not accept color-coded inserts
- ▶ Sterilized by gamma radiation
- ▶ Certified nonpyrogenic

### External Thread Cryogenic Vials with Plug Seal Cap Ordering Information

Cat. No.	Capacity (mL)	Style	Self-Standing	Qty/Pk	Qty/Cs
430289	2.0	Round Bottom	No	50	500

**Warning!** Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquified gas. Always use appropriate safety equipment when removing vials from cryogenic storage.



External Thread Cryogenic Vials with Plug Seal Cap





Cap Inserts

### Cap Inserts for Cryogenic Vials

- ▶ Cap inserts provide color coding for easy sample identification
- ▶ Inserts are packaged in resealable bags
- ▶ Nonsterile
- ▶ Cap inserts fit all Corning® cryogenic vials except Cat. No. 430289

#### Cryogenic Vials Cap Inserts Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
430499	Assorted colors, polypropylene cap inserts: 100 each of white, blue, red, green, and yellow	50	500
2015	White polypropylene cap inserts	50	500
2016	Blue polypropylene cap inserts	50	500
2017	Red polypropylene cap inserts	50	500
2018	Green polypropylene cap inserts	50	500
2019	Yellow polypropylene cap inserts	50	500

### Cryogenic Vial Racks and Storage Boxes

- ▶ Reusable racks are designed for use with most cryogenic vials
- ▶ Cat. No. 430525 has a locking feature for use with all Corning self-standing vials

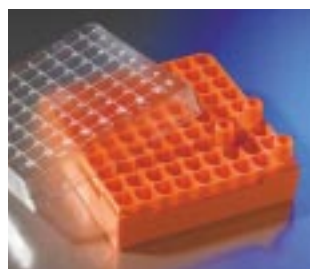
#### Cryogenic Vial Racks and Storage Boxes Ordering Information

Cat. No.	Description	Qty/Pk	Qty/Cs
430525	Polycarbonate rack and tray, holds 30 vials; self-locking design in ice/water bath	1	1
430526	Polycarbonate rack only, holds 30 vials; self-locking design	1	1
431131	Reusable orange polypropylene vial rack, holds 50 vials; self-locking design	2	2
431119	81 count (9 x 9 array) Cryogenic Box, for 1-2 mL vials	5	10
431120	81 count (9 x 9 array) Cryogenic Box, for 4-5 mL vials	5	10
431121*	100 count (10 x 10 array) Cryogenic Box, for 1-2 mL vials	5	10

\*431121 accepts internally threaded cryogenic vials only.



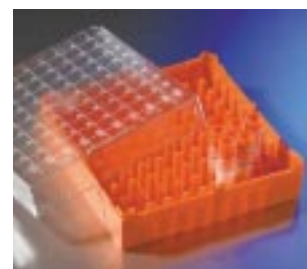
Cryogenic Vial Racks



431119 Cryogenic Storage Box



431120 Cryogenic Storage Box



431121 Cryogenic Storage Box

## Technical Appendix

### SELECTING THE BEST FILTER FOR YOUR APPLICATION

Choosing a filter does not have to be complicated - Corning has simplified the process. Just follow these four easy steps:

**Step 1: Match your application with the best pore size.**

**Step 2: Select the best membrane and housing material for your application.**

**Step 3: Select the correct membrane diameter to optimize flow rate and throughput.**

**Step 4: Choose the best filter design for your application.**

#### Step 1: Match Your Application with the Best Pore Size

The pore size is usually determined by your application or objective.

- ▶ Routine laboratory sterilization of most media, buffers, biological fluids and gases is usually done with 0.2 or 0.22  $\mu\text{m}$  pore filter membranes
- ▶ Clarification and prefiltration of solutions and solvents is best accomplished with 0.45  $\mu\text{m}$  or larger filter membranes
- ▶ Prefiltration to improve filter performance can also be accomplished by the use of glass fiber prefilters sold separately.

Use Table 1 to match your applications with a recommended membrane and pore size.

#### Step 2: Select the Best Membrane and Housing Material for Your Application

Your filter unit must be fully compatible with the chemical characteristics of your sample.

- ▶ Some filter membranes contain nontoxic wetting agents that may interfere with some applications
- ▶ Other membranes may bind proteins or other macromolecules leading to premature filter clogging or loss of valuable samples

Therefore, it is very important to understand their characteristics and the potential effects filter membranes can have on the solutions they contact. The following four graphs (Figure 1)

**Table 1. Selecting the Pore Size**

Application	Pore Size ( $\mu\text{m}$ )	Membrane Availability
Sterilization and Ultracleaning of Aqueous Solutions	0.20 to 0.22	All Membranes except Teflon™
Ultracleaning of Solvents (HPLC)	0.20 to 0.22	RC*, Teflon, Nylon
Clarification of Aqueous Solutions	0.45	All Membranes except Teflon
Clarification of Solvents (HPLC)	0.45	RC, Teflon, Nylon
Coarse Particle Removal	0.8	SFCA*, Glass Fiber Prefilters

\*RC = Regenerated Cellulose, SFCA = Surfactant-Free Cellulose Acetate.

**Figure 1. Important Performance Characteristics of Corning® Filter Membranes**



PES = Polyethersulfone, CA = Cellulose Acetate, CN = Cellulose Nitrate, NY = Nylon

compare the flow rates, levels of extractable materials, and relative amounts of protein binding of four of the most popular membranes used in Corning® filters. Combining this with the information from Tables 2 and 3 (page 118) will help you choose the best Corning membranes for your applications.

#### Corning Filter Membrane Materials

**Polyethersulfone (PES)** membranes are the best for filtering cell culture media. PES has very low protein binding and extractables. PES also demonstrates faster flow rates than cellulose or nylon membranes.

**Cellulose acetate (CA)** membranes have a very low binding affinity for most macromolecules and are especially recommended for applications requiring low protein binding, such as filtering culture media containing sera. However, both cellulose acetate and cellulose nitrate membranes are naturally hydrophobic and have small amounts (less than 1%) of non-toxic wetting agents added during manufacture to ensure proper wetting of the membrane. If desired, these agents can be easily removed prior to use by filtering a small amount of warm purified water through the membrane or filter unit. Surfactant free cellulose acetate membranes, with very low levels of extractables, are available on some Corning® syringe filters.

**Cellulose nitrate (CN)** membranes are recommended for filtering solutions where protein binding is not a concern. They are recommended for use in general laboratory applications such as buffer filtration. Corning's cellulose nitrate membranes are Triton X-100®-free and noncytotoxic.

**Nylon** membranes are naturally hydrophilic and are recommended for applications requiring very low extractables since they do not contain any wetting agents, detergents or surfactants. Their greater chemical resistance makes them better

for filtering more aggressive solutions, such as alcohols and DMSO. However, like cellulose nitrate membranes, they may bind greater amounts of proteins and other macromolecules than do the cellulose acetate or PES membranes. They are recommended for filtering protein-free culture media.

**Regenerated cellulose (RC)** membranes are hydrophilic and have very good chemical resistance to solvents, including DMSO. They are used to ultraclean and de-gas solvents and mobile phases used in HPLC applications.

**Teflon™ (PTFE; polytetrafluoroethylene)** membranes are naturally and permanently hydrophobic. They are ideal for filtering gases, including humidified air. The extreme chemical resistance of Teflon membranes makes them very useful for filtering solvents or other aggressive chemicals for which other membranes are unsuitable. Because of their hydrophobicity, Teflon membranes must be prewetted with a solvent, such as ethanol, before aqueous solutions can be filtered.

**Glass fiber filters** are used as depth filters for prefiltering solutions. They have very high particle loading capacity and are ideal for prefiltering dirty solutions and difficult to filter biological fluids such as sera.

**Table 2. Characteristics of Corning Filter Membranes**

	Cellulose Nitrate	Cellulose Acetate	Nylon	Polyether-Sulfone	Regenerated Cellulose	Teflon (PTFE)
Flow rates for medium with 10% serum	Good	Very Good	Poor	Best	NA	NA
Wetting Agents	Yes	Yes	No, naturally hydrophilic	No	Yes	Does not wet
Protein Binding	Very high	Very low	Low to moderate	Very low	Low	NA
DNA Binding	High	Very low	Very high	Very low	Low	NA
Chemical Resistance	Low	Low	Moderate to high	Low	Very high	Very high

**Table 3. Chemical Resistance Guide for Corning Filters**

This information has been developed from a combination of laboratory tests, technical publications, or material suppliers. It is believed to be reliable. Due to conditions outside of Corning's control, such as variability in temperatures, concentrations, duration of exposure and storage conditions, no warranty is given or is to be implied with respect to this information.

Chemical Class	Filter Membranes								Housing Materials				
	CN	CA	PC	NY	PES	RC	PTFE	PET	PS	PP	AC	PYR	PVC
Weak Acids	2	2	1	2	3	1	1	1	1	1	2	1	1
Strong Acids	3	2	3	3	3	3	1	3	2	1	3	2	1
Alcohols	3	1	1	1	1	1	1	1	2	1	3	1	1
Aldehydes	2	3	2	2	3	2	1	1	3	1	3	1	3
Aliphatic Amines	3	3	3	1	1	1	1	1	3	1	3	1	2
Aromatic Amines	3	3	3	2	3	1	1	2	3	1	3	1	3
Bases	3	3	3	2	3	2	1	3	1	1	2	2	1
Esters	3	3	2	1	3	1	1	1	3	2	2	1	3
Hydrocarbons	2	2	2	2	3	1	1	1	3	2	2	1	2
Ketones	3	3	2	2	3	1	1	1	3	2	3	1	3

Key: 1 = Recommended, 2 = May be suitable for some applications, a trial run is recommended, 3 = Not recommended, CN = Cellulose Nitrate, CA = Cellulose Acetate, NY = Nylon, PYR = PYREX Glass, PC = Polycarbonate, PES = Polyethersulfone, PET = Polyethylene Terephthalate, RC = Regenerated Cellulose, PS = Polystyrene, PTFE = Polytetrafluoroethylene (Teflon), PP = Polypropylene, PVC = Polyvinylchloride, AC = Acrylic Copolymer.

### Corning® Filter Housing Materials

The filter housing materials also must be compatible with the solutions being filtered.

**Polystyrene (PS)** is used in the filter funnels and storage bottles for all of the Corning plastic vacuum filters. This plastic polymer should only be used in filtering and storing nonaggressive aqueous solutions and biological fluids. Refer to Table 3 (page 118) for more chemical compatibility information.

**Acrylic copolymer (AC)** and **Polyvinyl chloride (PVC)** are used in some of the Corning syringe filter housings. These plastics should only be used in filtering less aggressive aqueous solutions and biological fluids. Refer to Table 3 for more chemical compatibility information.

**Polypropylene (PP)** is used in the Spin-X® centrifuge filters and some of the syringe and disc filter housings. This plastic polymer has very good resistance to many solvents. Refer to Table 3 for more chemical compatibility information.

### Chemical Compatibility

The mechanical strength, color, appearance, and dimensional stability of Corning filters are affected to varying degrees by the chemicals with which they come into contact. Specific operating conditions, especially temperature and length of exposure, will also affect their chemical resistance. Table 3 provides basic information on the chemical resistance of Corning filter membranes and housings.

### Step 3: Select the Correct Membrane Diameter to Optimize Flow Rate and Throughput

The third step is selecting a filter that will have enough volume capacity or throughput to process your entire sample quickly and efficiently. This is primarily determined by the effective surface area of the membrane. Table 4 shows the relationship between filter diameter, effective filtration surface area and expected throughput volumes. The lower values are typical of viscous or particle-laden solutions; the higher values are typical of buffers or serum-free medium.

### Step 4: Choose the Best Filter Design for Your Application

#### Disposable Plastic Vacuum Filters

These sterile filters are available in four styles: complete filter/ storage systems, bottle top filters, centrifuge tube top filters, or one-piece filter systems. Four membranes are available to meet all of your filtration needs: cellulose acetate, cellulose nitrate, nylon, or polyethersulfone.

#### Disposable Syringe/Disc Filters

The smaller conventional Corning syringe disc-type filters (4, 15, 25, and 26 mm diameter) are used with syringes which

**Table 4. Typical Expected Throughput Volumes**

Filter Diameter and Description	Area (cm <sup>2</sup> ) Throughput (mL)*	Effective Filter Expected
4 mm syringe/disc	0.07	0.05-3
15 mm syringe/disc	1.7	3-15
µStar® syringe filter	3.0	15-100
25 mm syringe/disc	4.8	15-100
26 mm syringe/disc	5.3	15-100
50 mm disc	19.6	100-750
50 mm vacuum system	16.6	100-750
60 mm vacuum system	24.6	200-1,000
70 mm vacuum system	38.5	300-1,500
90 mm vacuum system	58.1	500-2,000

\*These values assume an aqueous solution and a 0.2 µm membrane. Solutions containing sera or other proteinaceous materials will be at the lower end of the range. Use of prefilters may extend the throughput 50 to 100% above the values shown.

serves as both the fluid reservoir and the pressure source. The HPLC certified nonsterile syringe filters are available with nylon, regenerated cellulose or Teflon® (PTFE) membranes in polypropylene housing for extra chemical resistance. The sterile tissue culture tested syringe filters are available in PES, regenerated cellulose (ideal for use with DMSO-containing solutions) or surfactant-free cellulose acetate membranes in either polypropylene or acrylic copolymer housings.

The larger 50 mm diameter disc filter has a Teflon (PTFE) membrane and polypropylene housing with hose barb connectors. This product is ideal for filtering aggressive solvents or gases and applications requiring sterile venting of gases. Because they have a hydrophobic (will not pass aqueous solutions) membrane, they are also ideal for protecting vacuum lines and pumps.

### Spin-X® Disposable Centrifuge Tube Filters

Costar® Spin-X centrifuge tube filters consist of a membrane-containing (either cellulose acetate or nylon) filter unit within a polypropylene centrifuge tube. They filter small sample volumes by centrifugation for bacteria removal, particle removal, HPLC sample preparation, removal of cells from media, and purification of DNA from agarose and polyacrylamide gels. (See Corning Technical Bulletin: *Spin-X Purification of DNA from agarose gels* at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).)

### Corning FiltrEX™ 96 and 384 Well Filter Plates

Information on Corning FiltrEX 96 and 384 well filter plates can be found in the Corning Genomics Selection Guide or on the Corning Life Sciences web site [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

**Table 5. Corning® Filter Designs**

Design	Sterile	Filter Diameters (mm)	Available Membrane Materials	Pore Sizes (µm)	Special Features
Syringe Filters	Some	4, 15, 25, and 26,	RC, PES, SFCA, NY, and PTFE	0.2, 0.45, and 0.8	Ideal for small volume pressure filtration
µStar® Syringe Filters	Yes	Not applicable	CA and CN	0.22, 0.45, and 0.8	Ideal for sterilizing aqueous solutions and biological fluids
Disc Filters	Yes	50	PTFE	0.2	Ideal for filtering solvents and gases
Vacuum Filter Storage Systems	Yes	50, 70 and 90	PES, CA, CN, and Nylon	0.2, 0.22, and 0.45	Easy grip bottles for storing filtrate
Bottle Top Vacuum Filters	Yes	50, 70 and 90	PES, CA, CN, and Nylon	0.2, 0.22, and 0.45	2 neck widths to fit most glass bottles
Tube Top Vacuum Filters	Yes	50	CA	0.22 and 0.45	Minimizes unnecessary transfers by filtering into a 50mL centrifuge tube
115 One Piece Vacuum Filters	Yes	60	CA and CN	0.2 and 0.45	Very economical with separate pour spout
Spin-X® Centrifuge Filters	Some	7.7	CA and Nylon	0.22 and 0.45	Ideal for purifying DNA from agarose gels
FiltrEX™ 96 and 384 Well Filter Plates	Some	6.4, 3.2	PVDF, GlassFiber, PES, NC, and UF	0.2, 0.45, 1.2 and others	Clear, opaque, or solvent resistant*

\*Call for specific details; several custom-made products available.

CN = Cellulose Nitrate, CA = Cellulose Acetate, PES = Polyethersulfone, RC = Regenerated Cellulose, PTFE = Polytetrafluoroethylene (Teflon), SFCA = Surfactant-Free Cellulose Acetate.

## CHARACTERISTICS OF CORNING PLASTICWARE

		Polystyrene	Polyethylene (High Density)	Polypropylene	Polycarbonate	Nylon	P.T.F.E. (Teflon®)
<b>Physical Characteristics</b>	Basic Properties	Biologically inert, hard, excellent optical qualities	Biologically inert, high chemical resistance	Biologically inert, high chemical resistance, exceptional toughness	Clear, very tough, inert, high temperature resistance	Tough, heat resistant, machinable, high moisture vapor transmission	Biologically and chemically inert, high resistant slippery surface
	Clarity	Clear	Opaque	Translucent	Clear	Opaque	Opaque
	Autoclave Results	Melts	May distort	Withstands several cycles	Withstands one cycle	OK	OK
	Heat Distortion Point	147-175°F 64-80°C	250°F 121°C	275°F 135°C	280-290°F 138-143°C	300-356°F 150-180°C	250°F 121°C
	Burning Rate	Slow	Slow	Slow	Self-extinguishing	Self-extinguishing	None
<b>Effects of Laboratory Reagents</b>	Weak Acids	None	None	None	None	None	None
	Strong Acids	Oxidizing acids attack	Oxidizing acids attack	Oxidizing acids attack	May be attacked	Attacked	None
	Weak Alkalies	None	None	None	None	None	None
	Strong Alkalies	None	None	None	Slowly attacked	None	None
	Organic Solvents	Soluble in aromatic chlorinated hydrocarbons	Resistant below 80°C	Resistant below 80°C	Soluble in chlorinated hydrocarbons; partly soluble in aromatics	Resistant	Resistant
<b>Gas Permeability of Thin Wall Products*</b>	O <sub>2</sub>	Low	High	High	Very low	Very low	–
	N <sub>2</sub>	Very low	Low	Low	Very low	Very low	–
	CO <sub>2</sub>	High	Very high	Very high	Low	–	–

Portions of this table courtesy of Modern Plastics Encyclopedia. Most data are from tests by A.S.T.M. methods. Tables show averages or ranges. Many properties vary with manufacturer, formulation, testing laboratory, and the specific operating conditions.

\*Obtained from a table which lists gas permeability in CC/100 sq. inches per 24 hrs./mil.

## CHEMICAL COMPATIBILITY OF CORNING PLASTICWARE

	PS	PP	PVC	CA	PC	CN	NY	MCE	PTFE	PET
<i>Acids</i>										
Hydrochloric acid (25%)	G	G	G	N	R	R	N	O	R	R
Hydrochloric acid (concentrated)	F	G	F	N	R	N	N	N	R	O
Nitric acid (concentrated)	P	P	P	N	R	N	N	N	O	N
Nitric acid (25%)	P	G	F	N	R	L	N	O	R	R
<i>Alcohols</i>										
Butanol	G	G	G	R	R	R	R	R	R	R
Ethanol	G	G	G	R	R	N	R	O	R	R
Methanol	G	G	G	R	R	N	R	O	R	R
<i>Amines</i>										
Aniline	G	G	P	N	N	R	R	N	R	O
Dimethylformamide	P	G	F	N	N	N	R	N	R	N
<i>Bases</i>										
Ammonium hydroxide (25%)	F	G	G	R	N	R	R	O	N	O
Ammonium hydroxide (1N)	F	G	G	N	N	R	R	O	N	N
Sodium hydroxide	G	G	G	N	N	N	R	N	R	N
<i>Hydrocarbons</i>										
Hexane	P	G	F	R	R	R	R	R	R	R
Toluene	P	G	P	R	O	R	R	R	R	N
Xylene	P	F	P	R	R	R	R	R	R	N
Dioxane	P	G	P	N	N	N	R	N	R	R
Dimethylsulfoxide (DMSO)	P	G	P	N	N	N	R	N	R	O*
<i>Halogenated Hydrocarbons</i>										
Chloroform	P	G	P	N	N	R	R	N	R	R
Methylene chloride	P	F	P	N	N	R	R	N	R	N
<i>Ketones</i>										
Acetone	P	G	P	N	O	N	R	N	R	R
Methyl ethyl diketone	P	G	P	N	O	N	R	O	R	R

\*Can be used with aqueous solutions containing up to 20% DMSO.

R = Recommended, L = Limited Resistance, N = Not Recommended, O = Testing Advised, F = Fair, G = Good, P = Poor, PP = Polypropylene, PVC = Polyvinyl Chloride, CA = Cellulose Acetate, PC = Polycarbonate, PTFE = Polytetrafluoroethylene PS = Polystyrene, CN = Cellulose Nitrate, NY = Nylon, MCE = Mixed Cellulose Esters, PET = Polyethylene Terephthalate.

## CHARACTERISTICS OF CORNING® CENTRIFUGE TUBES

The following information is provided to serve as a general guideline for determining suitability of Corning centrifuge tubes for your applications. In addition, Corning recommends following the procedures outlined by the centrifuge manufacturer, as well as conducting a trial run to determine proper conditions before beginning any critical applications.

Corning centrifuge tubes are tested for leakage. They should not break or leak if used in a properly balanced rotor with suitable carriers, holders, and adapters that fully support the tubes when run in accordance with the guidelines in this section. These tubes are intended for one-time use only; reuse is not recommended as breakage or leakage may occur.

The recommended working temperature range for Corning centrifuge tubes is 0 to 40°C. The suitability of these tubes for storage below 0°C depends on both the solution and the

storage conditions. In general, the polypropylene and PET tubes are more resistant to stress at low temperatures than polystyrene. It is strongly recommended that a trial run be performed under actual conditions to test the suitability of the tubes for frozen storage.

### Suggestions for Safe Centrifugation

- ▶ **Caution:** When centrifuging pathogenic organisms, clinical specimens known or suspected of being infectious, or any other potentially biohazardous materials, approved safety containment systems should be used. Contact your centrifuge manufacturer for appropriate accessories or recommendations.
- ▶ Read protocols and instruction manuals carefully. Do not confuse speed or revolutions per minute (RPM) with relative centrifugal force (RCF). Instructions for centrifuging a sample at a given RPM and time are incomplete unless the rotor or radius is specified. Protocols should always state the time and RCF value for centrifuging a sample.



- Proper balancing and distribution of the load in a centrifuge is critical for optimum performance and to prevent damage to the tubes or centrifuge. Opposing buckets or loads should always be balanced within the range specified by the manufacturer. Tubes should always be distributed in the buckets with respect to the center of rotation as well as the pivotal axis of the bucket. Failure to do this may prevent the bucket from achieving a horizontal position during the centrifugation run. Uneven separations or tube failure may result.

These centrifuge tubes are intended for use by persons knowledgeable in safe laboratory practices. Failure can result from surface damage, exceeding the specified RCF values, using unsuitable support systems, improper temperatures, or incompatible chemicals.

The RCF ratings for Corning® disposable centrifuge tubes have been established at room temperature using tubes filled to nominal capacity with water and spun in a horizontal rotor

centrifuge for 5 minutes. The centrifuge must be equipped with the recommended carriers, adapters, and cushions that fully support the tubes. If an angle head rotor is used or proper support is not provided, RCF values will be lower. Use of liquid other than water may also lower RCF values. Please consult your centrifuge specifications and the nomogram table (page 123) to determine speeds at which maximum RCF is achieved.

### Chemical Compatibility of Disposable Plastic Centrifuge Tubes

The mechanical strength, flexibility, color, weight and dimensional stability of all plastic centrifuge tubes are affected to varying degrees by the chemicals with which they come in contact. Specific operating conditions, especially temperature, RCF, rotor type, carrier design, and run length will also affect tube performance.

### Physical Properties of Disposable Plastic Centrifuge Tubes

	Clear Polypropylene	Opaque Polypropylene	New Polyethylene Terephthalate
Recommended Working Temp*	0-40°	0-40°	0-40°
Heat Distortion Point	121°	121°	70°
Flexibility	Moderate	Moderate	Rigid
Transparency	Clear	Opaque	Clear
Maximum RCF:			
15 mL Tube	8,400 x g	–	3,600 x g
50 mL Tube	9,400 x g	–	3,600 x g
250 mL Tube	–	6,000 x g	–
500 mL Tube	–	6,000 x g	–

\*At room temperature for 24 hours.

### Chemical Resistance of Disposable Plastic Centrifuge Tubes\*

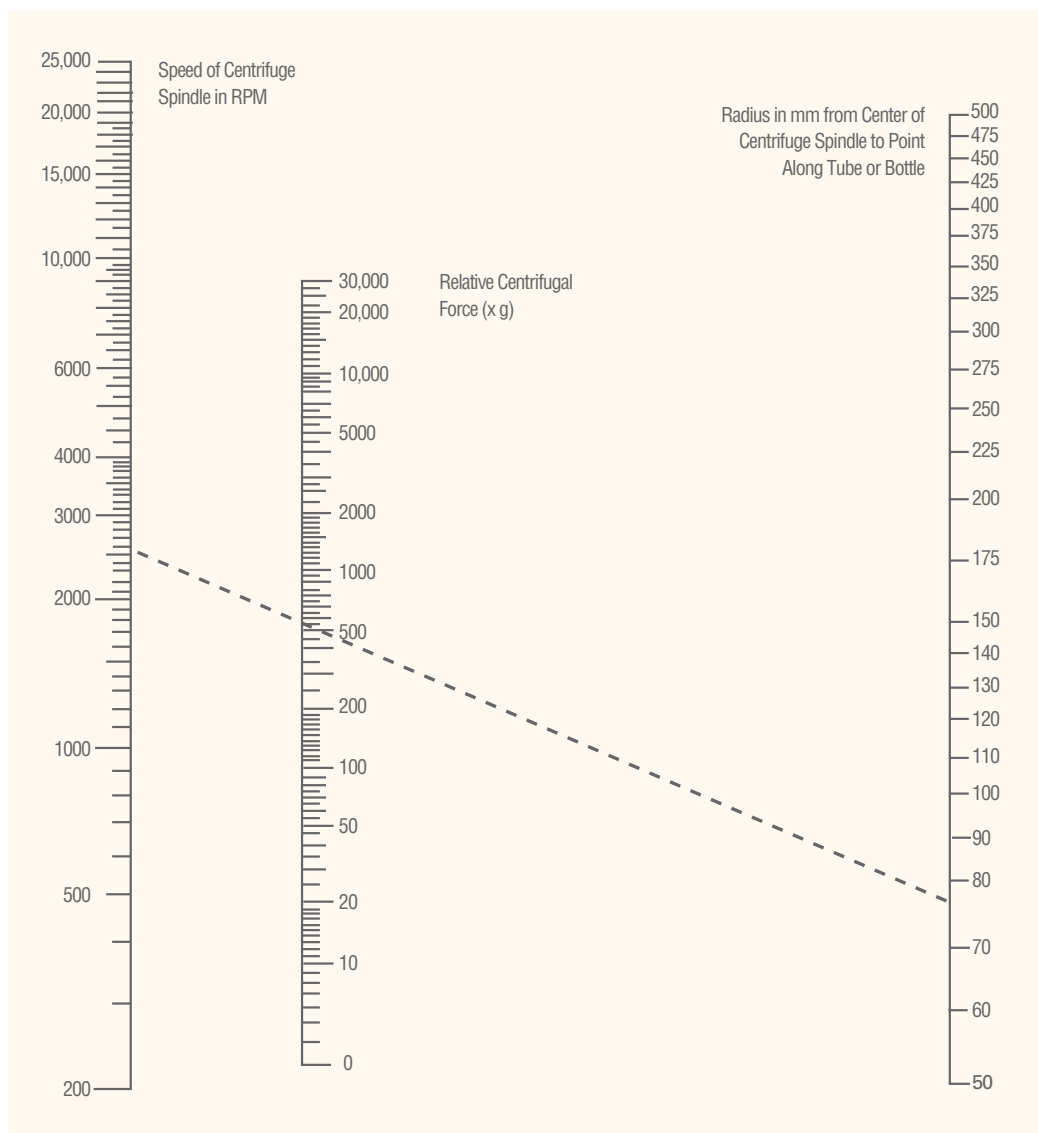
Chemical Class	Polyethylene Terephthalate	Polypropylene	Polyethylene Caps
Acids (weak)	1	1	1
Acids	3	1	1
Alcohols	1	1	1
Aldehydes	3 <sup>a</sup>	2 <sup>a</sup>	1
Bases	3	1	1
Esters	2	2	2
Hydrocarbons:			
Aliphatic	1	2	3
Aromatic	3	3 <sup>b</sup>	3
Halogenated	2	3	3
Ketones	2	2 <sup>c</sup>	2

\*At room temperature for 24 hours.

1 = Recommended; 2 = Suitable for most applications. However, a trial run under specific operating conditions is recommended; 3 = Not recommended.

Note: a = Formaldehyde, rated 1; b = Phenol, rated 1; c = Acetone, rated 1.

**NOMOGRAM FOR COMPUTING RELATIVE CENTRIFUGAL FORCE**



To calculate the RCF value at any point along the tube or bottle, measure the radius, in mm, from the center of the centrifuge spindle to the particular point. Draw a line from the radius value on the right hand column to the appropriate centrifuge speed on the left-hand column. The RCF value is the point where the line crosses the center column. The nomogram is based on the formula:

$$RCF = (11.17 \times 10^{-7}) RN^2$$

where:

R = Radius in mm from centrifuge spindle to point in tube bottom

N = Speed of spindle in RPM

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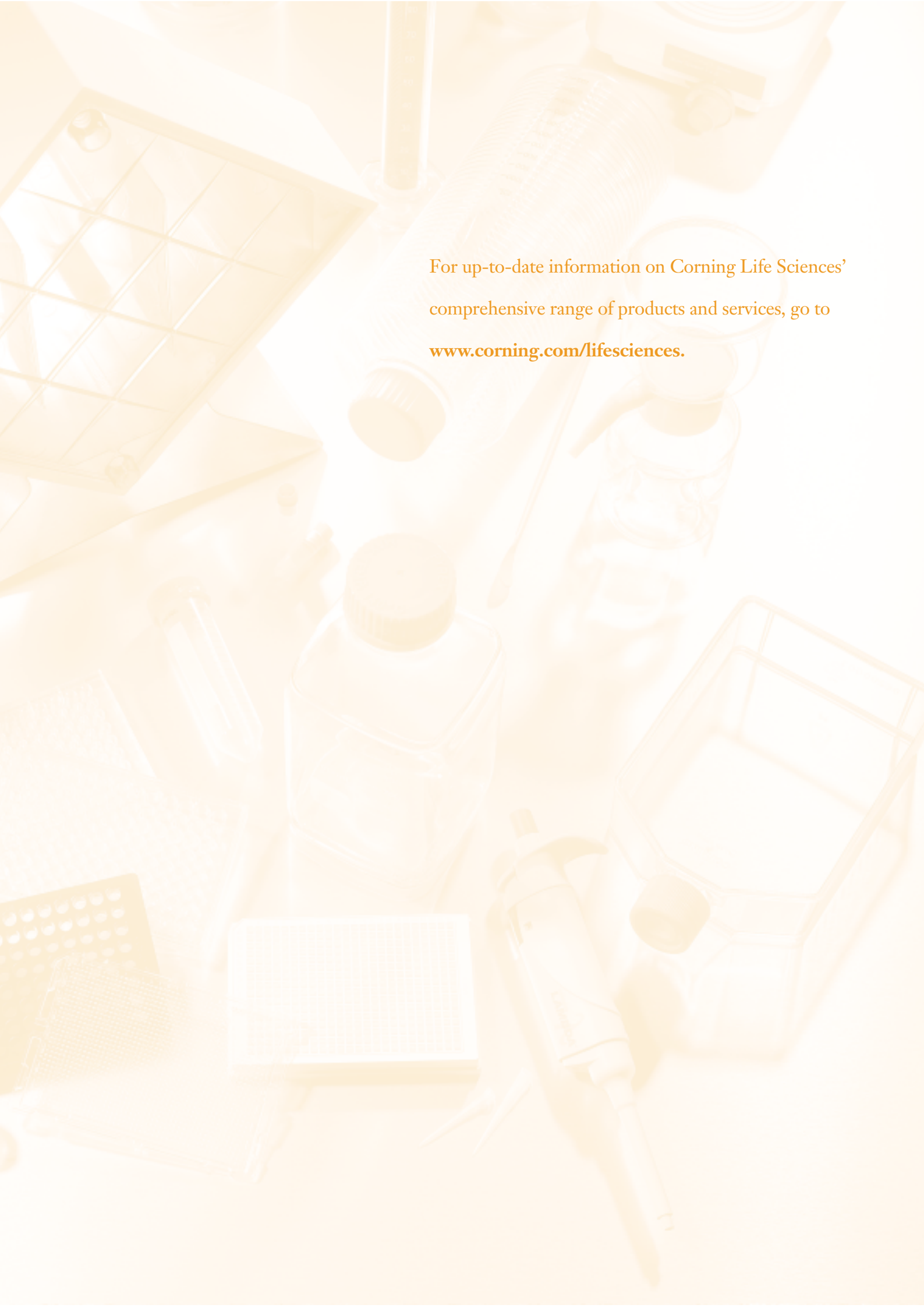
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