

# Corning Cell Culture Product Selection Guide



CORNING

## Introduction

Corning Life Sciences is pleased to present our Cell Culture 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
- ▶ Product catalog information
- ▶ Product literature
- ▶ Complete distributor information

For additional product information, please visit **[www.corning.com/lifesciences](http://www.corning.com/lifesciences)**, or call 1.800.492.1110. Customers outside the United States, please call 1.978.442.2200 or contact your local support office. Local offices are listed on the back cover.

## Ordering Information

Corning products are available through any authorized Corning support office or distributor. Please see our website for a complete listing.

To place an order, simply contact the distributor of your choice. For each requested product, provide the Corning catalog number, product description, and desired quantity.



## 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 9001 registered.

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

Also available are detailed drawings that highlight product dimensions. Drawings are available simply by calling your local Corning Life Sciences office or by calling Scientific Support at 1.800.492.1110.

### ADDITIONAL QUALITY ASSURANCES

#### Nonpyrogenic Certification

Most Corning and Costar cell culture products are certified nonpyrogenic with a documented endotoxin level less than or equal to 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 website [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

#### Lot Number Traceability

To ensure accurate lot number traceability in biotechnology research and production facilities, most 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 ISO-certified 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.

# Innovative Cell Culture Surfaces for the 21st Century

## Corning® Surfaces

For over 30 years, Corning culture vessels have been modified using corona discharge and vacuum plasma to generate better surfaces for growing attached cells.

Today's culture technologies, such as stem cells and tissue engineering, require new surfaces with new capabilities. Corning's investments in developing surface technologies are paving the way for these cell culture applications. See for yourself why Corning is the first and only name to trust for surfaces that are backed with a performance guarantee.

## Surfaces for Enhancing Cell Attachment

### Corning CellBIND® Surface

The unique Corning CellBIND surface uses a microwave process for incorporating significantly more oxygen into the cell culture surface, rendering it better for cell attachment especially under difficult conditions.

- ▶ Quickly adapts cells to reduced serum or serum-free conditions
- ▶ Improves attachment and yield
- ▶ No special handling or storage required

### Corning Synthemax® Self-coating Substrate

Corning Synthemax self-coating substrate is a unique, animal-free, synthetic Vitronectin-based peptide containing the RGD motif and flanking sequences. The Synthemax substrate allows for scalable, multi-passage expansion of pluripotent stem cells in serum-free media, such as mTeSR®, subsequent to differentiation into a number of cell types, including retinal pigment epithelial cells and cardiomyocytes, as well as propagation of various progenitor cell types.

## Corning Osteo Assay Surface

The Corning Osteo Assay surface is designed for:

- ▶ Direct assessment of osteoclast and osteoblast functional *in vitro* activity
- ▶ Osteoclast and osteoblast precursor differentiation
- ▶ Co-culture of osteoclast and/or osteoblasts with other cell lines
- ▶ Solution-based quantitative assays
- ▶ Studies related to bone remodeling and pit formation

## Corning Microplates with Poly-D-Lysine-coated Surface

Corning Poly-D-Lysine (PDL) microplates are coated with PDL (molecular weight range of 70 to 150 kDa), giving the surface a net positive charge for better cell attachment.

- ▶ Improves differentiation of primary neurons, glial cells, neuroblastomas
- ▶ Enhances attachment of transfected cell lines, including HEK-293
- ▶ Helps cells stay attached during assay processing

## Surfaces for Reducing or Preventing Cell Attachment

### Corning Ultra-Low Attachment-coated Polystyrene Surface

The Corning Ultra-Low Attachment surface uses a covalently bound hydrogel layer to inhibit cell attachment.

- ▶ Growing primary cultures of tumor or adult stem cells as unattached spheroids
- ▶ Prevents anchorage-dependent cells, such as fibroblasts, from attaching and dividing
- ▶ Promoting embryoid body formation from ES cells

	Cell Culture Formats							
	Flasks	Dishes	Multiple Well Plates	Microplates	Corning CellSTACK®	Corning HYPERFlask® Chambers	Cell Culture Tubes	Self-coating
<b>Corning Cell Culture Surfaces</b>								
<b>For enhancing cell attachment:</b>								
Original Tissue Culture (TC) surface	■	■	■	■	■		■	
Corning CellBIND surface	■	■	■	■	■	■		
Poly-D-Lysine-coated surface				■				
<b>For reducing or preventing cell attachment:</b>								
Ultra-Low Attachment surface	■	■	■	■	■			
<b>For specialized cell needs:</b>								
Corning Osteo Assay surface			■	■				
Corning Synthemax surface								■

For more information or product numbers, reference the format categories within this guide.

## Corning® CellBIND® Surface

*A Novel Surface for Improved Cell Attachment, Serum Reduction, or the Elimination of Coatings*

### Increase Cell Growth and Yields with Corning CellBIND Surface

The Corning CellBIND surface enhances cell attachment under difficult conditions, such as reduced-serum or serum-free medium, resulting in higher cell yields.

Developed by Corning scientists, this technology uses a microwave plasma process for treating the culture surface. This process improves cell attachment by incorporating significantly more oxygen into the cell culture surface, rendering it more hydrophilic (wetter) and increasing surface stability.

#### Benefits

- ▶ May eliminate the need for tedious, time-consuming, expensive and low stability biological coatings
- ▶ More quickly adapts cells to reduced-serum or serum-free conditions
- ▶ Increase cell survival following cryopreservation
- ▶ Reduces premature cell detachment from confluent cultures, especially in roller bottles
- ▶ Better cell attachment leads to increased cell growth and yields
- ▶ More consistent and even cell attachment
- ▶ Requires no refrigeration or special handling and is stable at room temperature

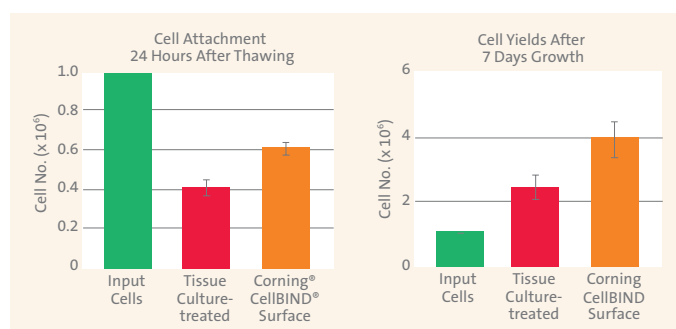
### Same High Quality Standards as Other Corning Vessels

- ▶ Manufactured from optically clear polystyrene
- ▶ Rigorous QC testing for consistency and reproducibility
- ▶ Sterile
- ▶ Nonpyrogenic
- ▶ Lot numbers for quality assurance and tracking
- ▶ Corning CellBIND surface logo differentiates from standard treatment cell culture products and avoids mix-ups

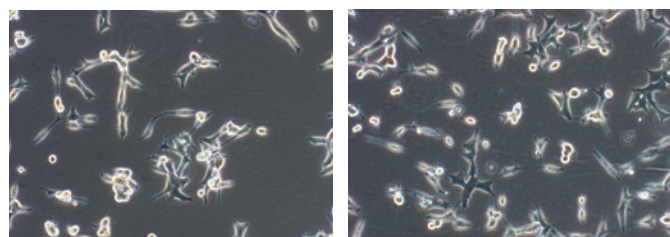
### Cell Dissociation Recommendations

Culture inoculating and harvesting should be performed in the same manner as methods currently being employed. Both enzymatic and non-enzymatic dissociating solutions have been successfully used to remove cells from Corning CellBIND surfaces. These include: Trypsin-EDTA, Accutase®, Versene®, Dispase®, and Citric Saline. Some dissociating agents, such as Dispase or Versene, should be removed by centrifugation prior to plating the cells.

### Enhanced Attachment of LNCaP Cells to the Corning CellBIND Surface\*



**Figure 1.** Left: Adherent cell recovery and growth of LNCaP cells 24 hours post-seeding. Data is average ± standard error from 3 independent experiments. Right: Average ± standard error from 3 independent experiments for 7 days of growth after initial attachment.



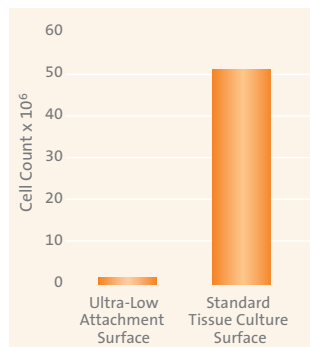
**Figure 2.** Attachment of LNCaP cells. Cells were thawed and plated onto the Corning CellBIND surface (right) or tissue culture-treated (left) T-25 flasks. 24 hours post-seeding a random field was viewed by light microscopy (100X magnification).

\*From *Enhanced Attachment of LNCaP Cells to the Corning CellBIND surface*, Corning SnAPPShot publication CLS-AN-048.

**Corning CellBIND surface** is available on flasks, multiple well plates, 96-well and 384-well microplates, and dishes.

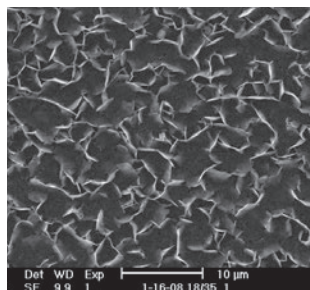
For Corning CellBIND surface roller bottles and Corning CellSTACK® culture chambers, see the **Bioprocess Product Selection Guide** (CLS-BP-028).

For Corning CellBIND surface microplates, see the **Microplates** section of this catalog or the **Microplates Product Selection Guide** (CLS-C-DL-MP-014).



#### Comparison of cell attachment in Ultra-Low Attachment surface 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 tissue culture-treated product.



Scanning electron micrograph of Corning Osteo Assay surface

## Ultra-Low Attachment Surface

### For Dishes, Plates, Flasks, and Corning® CellSTACK® Culture Chambers

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.

Suggested working volumes for Ultra-Low Attachment surface products:

- ▶ 96-well plate: 0.1 mL to 0.2 mL/well
- ▶ 24-well plate: 0.4 mL to 0.6 mL/well
- ▶ 6-well plate: 1.9 mL to 2.9 mL/well
- ▶ 60 mm dish: 4.2 mL to 6.3 mL/dish
- ▶ 100 mm dish: 11.0 mL to 16.5 mL/dish
- ▶ 25 cm<sup>2</sup> flask: 5 mL to 7.5 mL/flask
- ▶ 75 cm<sup>2</sup> flask: 15 mL to 22.5 mL/flask
- ▶ 636 cm<sup>2</sup> chamber: 127 mL to 191 mL/flask

There are no special procedures that need to be followed in order to use this surface.

For Ultra-Low attachment surface microplates, see the **Microplates** section of this catalog or the **Microplates Product Selection Guide** (CLS-C-DL-MP-014).

## Corning Osteo Assay Surface

### For Osteogenesis Research

The Corning Osteo Assay surface is a unique 3-dimensional structure that mimics *in vivo* bone for *in vitro* bone cell assays. This inorganic bone biomaterial surface in a multiple well plate is capable of supporting the functional properties of osteogenic cells. The assay surface is manufactured using a proprietary surface coating technology which delivers lot-to-lot consistency, translating to reliable and reproducible results in bone cell assays. This surface also offers a consistent and defined alternative to preparing dentine or bone slices, reducing the variability in your assay system and resulting in more predictable assay readouts.

The Corning Osteo Assay surface is designed for:

- ▶ Direct assessment of osteoclast and osteoblast functional *in vitro* activity
- ▶ Osteoclast and osteoblast precursor differentiation
- ▶ Co-culture of osteoclast and/or osteoblasts with other cell lines
- ▶ Solution-based quantitative assays
- ▶ Studies related to bone remodeling and pit formation

Cat. No.	Description	Qty/Pk	Qty/Cs
3987	24-well multiple well plate, Osteo Assay surface, polystyrene sterile, with proprietary coating	1	4
3989	1 x 8 Stripwell™ microplate, Osteo Assay surface, polystyrene, 12 strips per holder with lid, sterile, with proprietary coating	1	2

For Corning Osteo Assay surface microplates, see the **Microplates** section of this catalog or the **Microplates Product Selection Guide** (CLS-C-DL-MP-014).

## Corning Synthemax® Self-coating Substrate

Corning Synthemax self-coating substrate is a unique, animal-free, synthetic Vitronectin-based peptide containing the RGD motif and flanking sequences. The Synthemax substrate allows for scalable, multi-passage expansion of pluripotent stem cells in serum-free media, such as mTeSR®, subsequent to differentiation into a number of cell types, including retinal pigment epithelial cells and cardiomyocytes, as well as propagation of various progenitor cell types.

Cat. No.	Description	Qty/Pk	Qty/Cs
3535	Corning Synthemax II-SC substrate, 10 mg vial	1	1

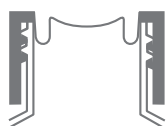


## Cell Culture Flasks

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

- ▶ Corning CellBIND® surface is a novel cell culture treatment that increases surface wettability for more even and consistent cell attachment.
- ▶ Ultra-Low Attachment surface flasks feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption and cellular activation.
- ▶ Manufactured from optically clear virgin polystyrene
- ▶ Treated for optimal cell attachment
- ▶ Printed lot numbers for traceability
- ▶ 100% integrity tested
- ▶ Sterile
- ▶ 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 pore, hydrophobic 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.

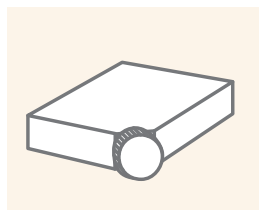


Angled neck flasks improve pipet access and reduce medium sloshing into the neck. This design was a Corning innovation that first appeared in 1988.

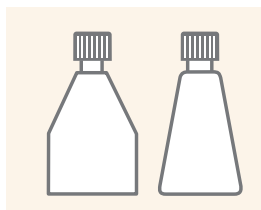


## Flask Shapes

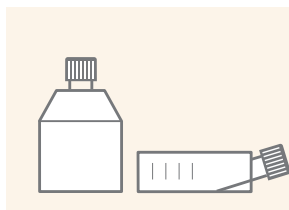
Choosing a flask shape is usually a matter of personal preference:



**Low profile flasks** have reduced height for incubator space savings. The corner neck gives direct access to the flask corner.



**Triangular and modified-triangular flasks** offer good pipet 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 pipet access. Most canted neck flasks also have an anti-tip 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.



**U-shaped T-75 flasks** have rounded shoulders for an easier grip and better access when removing or tightening the cap. The new ergonomic shape also reduces the number of corners, improves cell scraping, and allows the use of a larger pipet.

### Cell Culture Flasks

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

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
430168	TC-treated	Rectangular	Canted	Plug seal	20	500
430372	TC-treated	Rectangular	Canted	Phenolic style	20	500
430639	TC-treated	Rectangular	Canted	Vent	20	200
3055	TC-treated	Triangular	Angled	Phenolic style	20	500
3056	TC-treated	Triangular	Angled	Vent	10	200
3289	Corning® CellBIND®	Rectangular	Canted	Vent	20	200
3815	Ultra-Low Attachment	Rectangular	Canted	Vent	6	24
431463	Not treated	Rectangular	Canted	Vent	20	200



25 cm<sup>2</sup> triangular flask with vent cap (Cat. No. 3056)

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

430641U	TC-treated	U-shaped	Canted	Vent	5	100
430720U	TC-treated	U-shaped	Canted	Plug seal	5	100
430725U	TC-treated	U-shaped	Canted	Phenolic style	5	100
431464U	Not treated	U-shaped	Canted	Vent	5	100
3275	TC-treated	Modified triangular	Straight	Phenolic style	5	100
3276	TC-treated	Modified triangular	Straight	Vent	5	100
3290	Corning CellBIND	U-shaped	Canted	Vent	5	100
3814	Ultra-Low Attachment	U-shaped	Canted	Vent	4	24



25 cm<sup>2</sup> canted neck flask with vent cap (Cat. No. 430639)

#### Cell Culture Tip

Visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences) for technical cell culture application bulletins.



75 cm<sup>2</sup> canted neck U-shaped flask with vent cap (Cat. No. 430641U)



75 cm<sup>2</sup> canted neck U-shaped flask with phenolic style cap (Cat. No. 430725U)



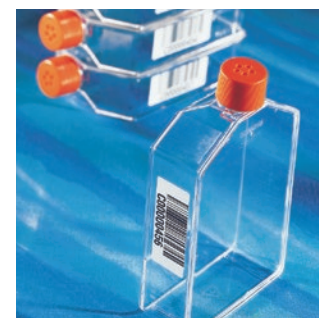
75 cm<sup>2</sup> triangular flask with phenolic style cap (Cat. No. 3275)



100 cm<sup>2</sup> low profile canted neck flask with vent cap (Cat. No. 3816)



150 cm<sup>2</sup> canted neck flask with plug seal cap (Cat. No. 430823)



175 cm<sup>2</sup> flask with vent cap and bar code (Cat. No. 431306)

### Cell Culture Flask Selection Tip

The low profile 100 cm<sup>2</sup> flask:

- ▶ gives 33% more area in the footprint of a T-75 flask
- ▶ has a 1/2 turn easy-opening cap
- ▶ saves 33% in incubator space
- ▶ uses 26% less plastic than a T-75 flask

### Cell Culture Flask Application Tip

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

#### 100 cm<sup>2</sup> Growth Area Low Profile Flask

Cat. No.	Surface	Flask Style	Neck Style	Cap Style	Qty/Pk	Qty/Cs
3816	TC-treated	Low profile	Canted	Vent	6	60
3073	Corning® CellBIND®	Low profile	Canted	Vent	6	60

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

430823	TC-treated	Rectangular	Canted	Plug seal	5	50
430824	TC-treated	Rectangular	Canted	Phenolic style	5	50
430825	TC-treated	Rectangular	Canted	Vent	5	50
3291	Corning CellBIND	Rectangular	Canted	Vent	5	50
431465	Not treated	Rectangular	Canted	Vent	5	50

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

3150	TC-treated	Traditional	Straight	Phenolic style	5	25
3151	TC-treated	Traditional	Straight	Vent	5	25

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

431079	TC-treated	Rectangular	Angled	Plug seal	5	50
431080	TC-treated	Rectangular	Angled	Vent	5	50
431085	TC-treated	Rectangular	Angled	Phenolic style	5	50
431306*	TC-treated	Rectangular	Angled	Vent	7	84
431328*	Corning CellBIND	Rectangular	Angled	Vent	7	84
3292	Corning CellBIND	Rectangular	Angled	Vent	5	50
3298	Corning CellBIND	Rectangular	Angled	Phenolic style	5	50
431466	Not treated	Rectangular	Angled	Vent	5	50

\*Flask pre-labeled with bar code, validated for use with Select™ robotic system.



25 cm<sup>2</sup> angled neck flask with vent cap (Cat. No. 431082)



225 cm<sup>2</sup> canted neck flask with vent cap (Cat. No. 3001)



Corning HYPERFlask vessel (Cat. No. 10024)

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

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

### 1720 cm<sup>2</sup> Growth Area Corning HYPERFlask® Vessel

Cat. No.	Description	Surface	Type	Qty/Pk	Qty/Cs
10024	HYPERFlask vessel	Corning CellBIND	Bar code, sterile	4	24
10030	HYPERFlask M vessel	Corning CellBIND	Bar code, sterile	1	4
10020	HYPERFlask M vessel	Corning CellBIND	Bar code, sterile	4	4
10031	HYPERFlask M vessel	Not treated	Bar code, sterile	4	24
10034	HYPERFlask M vessel	Corning CellBIND	Bar code, sterile	4	24
10035	33 mm caps	N/A	Not vented, sterile	1	4

\*Flask pre-labeled with bar code for use with Select™ robotic system.

### Cell Yields and Recommended Medium Volume

Corning and Costar® Flasks	Approximate Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Recommended Medium Volume (mL)
25 cm <sup>2</sup>	25	2.5 x 10 <sup>6</sup>	5 - 7.5
75 cm <sup>2</sup> canted neck	75	7.5 x 10 <sup>6</sup>	15 - 22.5
75 cm <sup>2</sup> straight neck	75	7.5 x 10 <sup>6</sup>	15 - 22.5
100 cm <sup>2</sup>	100	1.0 x 10 <sup>7</sup>	20 - 30
150 cm <sup>2</sup>	150	1.5 x 10 <sup>7</sup>	30 - 45
162 cm <sup>2</sup>	162	1.6 x 10 <sup>7</sup>	32 - 48
175 cm <sup>2</sup>	175	1.75 x 10 <sup>7</sup>	35 - 52.5
225 cm <sup>2</sup>	225	2.25 x 10 <sup>7</sup>	45 - 67.5
235 cm <sup>2</sup>	235	2.35 x 10 <sup>7</sup>	47 - 70.5
1720 cm <sup>2</sup>	1720	2.5 x 10 <sup>8</sup>	565

\*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.

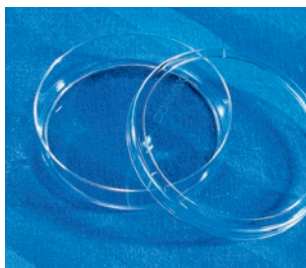
### Cell Culture Flask Selection Tip

The novel HYPERFlask vessel offers high yield and high performance with 10 growth surfaces and 1720 cm<sup>2</sup> growth area in the same footprint as the 175 cm<sup>2</sup> flask.

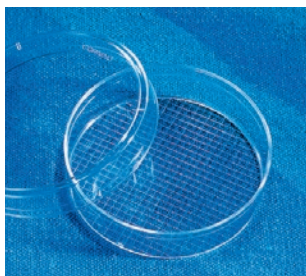
For Falcon® flasks, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).

For flasks with other surfaces, see the **Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide** (CLS-C-DL-AC-012).

## Cell Culture Dishes



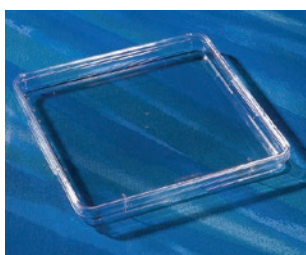
100 mm dishes coated with Corning CellBIND surface (Cat. No. 3296)



Gridded 60 mm dish (Cat. No. 430196)



500 cm² cell culture dish (Cat. No. 431110)



245 mm x 245 mm bioassay dish (Cat. No. 431111)

### Treated Cell Culture Dishes

- ▶ Corning® CellBIND® surface is a novel cell culture treatment that increases surface wettability for more even and consistent cell attachment
- ▶ Ultra-Low Attachment surface dishes feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption, and cellular activation
- ▶ 10 dishes/bag are available for 100 mm dishes (Cat. No. 430293)
- ▶ 245 mm square dishes offer 500 cm² growth surface
- ▶ Stacking beads aid in handling
- ▶ Vents provide consistent gas exchange
- ▶ Manufactured from optically clear virgin polystyrene
- ▶ Sterile
- ▶ Nonpyrogenic

Cat. No.	Surface	Dish Style* (mm)	Approx. Height (mm)	Growth Area (cm²)	Qty/Pk	Qty/Cs
3294	Corning CellBIND	35	10	9	10	210
430165	TC-treated	35	10	9	20	500
430166	TC-treated	60	15	21	20	500
3295	Corning CellBIND	60	15	21	7	126
3261	Ultra-Low Attachment	60	15	21	5	20
3262	Ultra-Low Attachment	100	20	55	5	20
430196	TC-treated	60 with 2 mm grid	15	21	20	500
3296	Corning CellBIND	100	20	152	5	40
430167	TC-treated	100	20	55	20	500
430293	TC-treated	100	20	55	10	480
430599	TC-treated	150	25	150	5	60
431110†	TC-treated	245	25	500	4	16

\*Dish style (mm) = actual growth surface diameters: 35 mm dish = 34.4 mm; 60 mm dish = 52.1 mm; 100 mm dish = 83.8 mm; 150 mm dish = 139.1 mm.

†Square dishes with interior bottom dimensions of 224 x 224 mm.

### 245 mm Square Bioassay Dishes

Square bioassay dishes are made from polystyrene and are 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.

Cat. No.	Description	Automation Compatibility	Qty/Pk	Qty/Cs
431111	245 mm x 245 mm, square, 18 mm deep not treated dish, sterile	PBA Flexys™ and Genetix “Q” Bot® automated colony picking and gridding robots	4	16
431272	245 mm x 245 mm, square, 18 mm deep not treated 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, not treated dish, sterile	PBA Flexys, Genetix “Q” Bot, BioRobotics BioPick	5	20



### Cell Culture Dish Application Tips

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

### Not Treated Cell Culture Dishes

- ▶ Manufactured from optically clear virgin polystyrene
- ▶ Not treated for applications where cell attachment is not desired
- ▶ Stacking beads aid in handling
- ▶ Vents provide consistent gas exchange.
- ▶ Sterile
- ▶ Nonpyrogenic

Cat. No.	Dish Style* (mm)	Height (mm)	Approx. Growth Area (cm <sup>2</sup> )	Qty/Pk	Qty/Cs
430588	35	10	9	20	500
430589	60	15	21	20	500
430591	100	20	55	20	500
430597	150	25	152	5	60
431111 <sup>†</sup>	245	25	500	4	16

\*Note: Dish style (mm) = actual growth surface diameters: 35 mm dish = 34.4 mm; 60 mm dish = 52.1 mm; 100 mm dish = 83.8 mm; 150 mm dish = 139.1 mm.

<sup>†</sup>Square dish with interior bottom plate dimensions of 224 x 224 mm.

### Expected Cell Yields and Recommended Medium Volumes

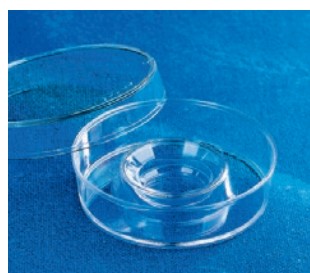
Corning Dishes	Approximate Growth Area (cm <sup>2</sup> )	Average Cell Yield*	Recommended Medium Volume (mL)
35 mm	9	9.0 x 10 <sup>5</sup>	1.8 - 2.7
60 mm	21	2.1 x 10 <sup>6</sup>	4.2 - 6.3
100 mm	55	5.5 x 10 <sup>6</sup>	11 - 16.5
150 mm	152	1.52 x 10 <sup>7</sup>	30.4 - 45.6
245 mm (square)	500	5.0 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.

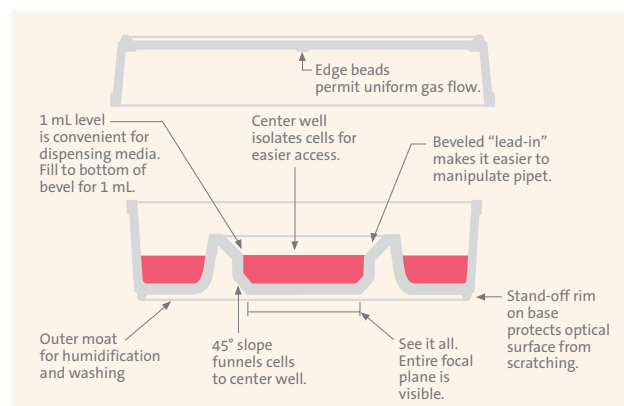
### Costar® 60 mm Center Well Culture Dish

Product is strictly not for human use in *in vitro* fertilization or assisted reproduction procedures. For research only. Not for use in diagnostic or therapeutic procedures.

- ▶ 20 mm center well
- ▶ Inner well holds 3 mL of medium, while the outer well holds 10 mL
- ▶ Treated for optimal cell attachment
- ▶ Sterile
- ▶ Nonpyrogenic



Costar 60 mm center well dish (Cat. No. 3260)



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

For IVF products, see the **Falcon® Product Selection Guide** (CLS-F-PSG-001).

For dishes with other surfaces, see the **Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide** (CLS-C-DL-AC-012).

## Multiple Well Plates



6-well culture plate  
(Cat. No. 3516)



12-well culture plate  
(Cat. No. 3513)



24-well culture plate  
(Cat. No. 3524)



48-well culture plate  
(Cat. No. 3548)

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

- ▶ Individual alphanumeric codes for well identification, flat bottoms
- ▶ Treated for optimal cell attachment (except where noted)
- ▶ Corning® CellBIND® surface is a novel cell culture treatment that increases surface wettability for more even and consistent cell attachment.
- ▶ Ultra-Low Attachment surface plates feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption, and cellular activation.
- ▶ Corning Osteo Assay surface is an inorganic crystalline coating, creating a surface that mimics *in vivo* bone-like, for *in vitro* bone cell culture and assays.
- ▶ Sterile
- ▶ Nonpyrogenic

#### 6-well

Cat. No.	Surface	Plate Type	Qty/Pk	Qty/Cs
3335	Corning CellBIND	Standard clear	5	50
3506	TC-treated	Standard clear	5	100
3516	TC-treated	Standard clear	1	50
3471	Ultra-Low Attachment	Standard clear with hydrogel*	1	24
3736	Not treated	Standard clear	5	100

#### 12-well

3336	Corning CellBIND	Standard clear	5	50
3512	TC-treated	Standard clear	5	100
3513	TC-treated	Standard clear	1	50
3737	Not treated	Standard clear	5	100

#### 24-well

3337	Corning CellBIND	Standard clear	5	50
3524	TC-treated	Standard clear	1	100
3526	TC-treated	Standard clear	1	50
3527	TC-treated	Standard clear	5	100
3473	Ultra-Low Attachment	Standard with hydrogel*	1	24
3738	Not treated	Standard clear	5	100
3987	Corning Osteo Assay	Standard clear	1	4

#### 48-well

3338	Corning CellBIND	Standard clear	5	50
3548	TC-treated	Standard clear	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 Bottom Diameter (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	9.5 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.

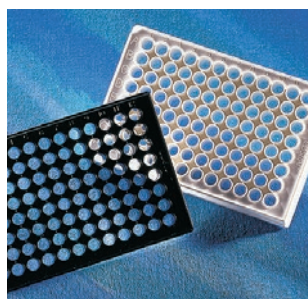
For Falcon® multiple well plates, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).

For multiple well plates with other surfaces, see the **Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide** (CLS-C-DL-AC-012).

# Cell Culture Microplates



96-well culture microplate



96-well clear-bottom microplates

## Corning® 96-well Cell Culture Microplates

- ▶ Nonreversible lids with condensation rings to reduce contamination (except where noted)
- ▶ Individual alphanumeric codes for well identification, flat bottoms (except where noted)
- ▶ Treated for optimal cell attachment (except where noted)
- ▶ Sterile
- ▶ Nonpyrogenic
- ▶ Corning CellBIND® surface is a novel cell culture treatment that increases surface wettability for more even and consistent cell attachment.
- ▶ Ultra-Low Attachment surface microplates feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption and cellular activation.
- ▶ Corning Osteo Assay surface is an inorganic crystalline coating, creating a surface that mimics *in vivo* bone, for *in vitro* bone cell assays.
- ▶ Corning Poly-D-Lysine (PDL) microplates are coated with PDL (molecular weight range of 70 to 150 kDa) giving the surface a net positive charge for better cell attachment.

Black microplates are designed to lower background in fluorescent assays and reduce cross-talk. White microplates are designed for luminescent assays. Some microplates have the Corning CellBIND surface or a PDL coating to enhance cell attachment. Corning offers many other 96-well microplate types for applications other than cell culture; for a complete listing, visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

## 96-well Microplate Dimensions, Expected Cell Yields, and Recommended Medium Volume

Cell Culture Microplate	Well Diameter (Bottom, mm)	Single Well Only				Entire Microplate		
		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

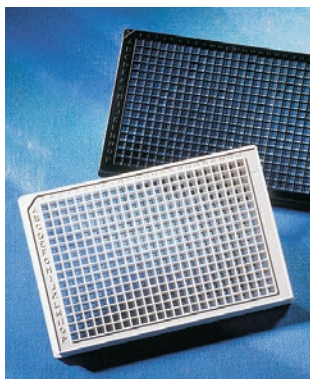
\*Assumes an average yield of 1 x 10<sup>5</sup> cells/cm<sup>2</sup> from a 100% confluent culture. Yields from many cell types can be lower than this.

<sup>†</sup>Because these wells are round, the surface area available for cell attachment is dependent on the medium volume used.

For Falcon® 96-well microplates, see the **Falcon® Product Selection Guide** (CLS-F-PSG-001).

For 96-well microplates, see the **Microplates Product Selection Guide** (CLS-C-DL-MP-014).

For 96-well microplates with other surfaces, see the **Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide** (CLS-C-DL-AC-012).



### Corning® 384-well Cell Culture Microplates

- Flat bottoms and lids
- Low volume microplates have only a 50 µL total well volume, with recommended working volume of 5 to 40 µL
- Treated for optimal cell attachment
- Sterile
- Nonpyrogenic

Black microplates are designed to lower background in fluorescent assays and reduce cross-talk. White microplates are designed for luminescent assays. Some microplates have the Corning CellBIND® surface or a Poly-D-Lysine coating to enhance cell attachment. Corning offers many other 384-well microplate types for applications other than cell culture. For a complete listing, visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

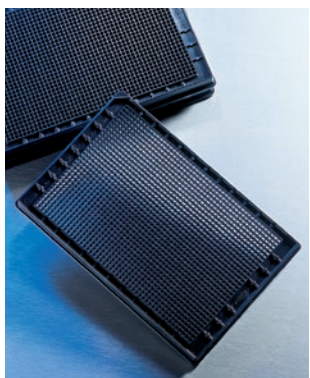
#### 384-well Microplate Dimensions, Expected Cell Yields, and Recommended Medium Volumes

Cell Culture Microplate	Well Bottom Diameter (mm)	Single Well Only				Entire Microplate		
		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)
Standard 384-well	2.7 x 2.7 <sup>†</sup>	0.056	5.6 x 10 <sup>3</sup>	0.125	0.025 - 0.050	21.5	2.15 x 10 <sup>6</sup>	9.6 - 19.2
Low Volume 384-well	2.0	0.031	3.1 x 10 <sup>3</sup>	0.050	0.005 - 0.040	12.0	1.2 x 10 <sup>6</sup>	1.9 - 15.3

\*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.

<sup>†</sup>These wells are square.

### Corning 1536-well Cell Culture Microplates



- Superior performance compared to competitor microplates: lower CV values, higher signal-to-noise ratios, and lower background fluorescence
- Compatible with bar coding, standard readers and automation
- Recommended working volume of up to 8 µL
- Treated for optimal cell attachment
- Flat bottoms and lids
- Sterile
- Nonpyrogenic

Black microplates are designed to lower background in fluorescent assays and reduce cross-talk. White microplates are designed for luminescent assays. Corning offers other 1536-well microplate types for applications other than cell culture. For a complete listing, visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

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

Cell Culture Microplate	Well Bottom Diameter (mm)	Single Well Only				Entire Microplate		
		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)
1536-well Clear Flat Bottom	1.63 x 1.63	0.025	2.5 x 10 <sup>3</sup>	12.5	5 - 8	38.3	3.8 x 10 <sup>6</sup>	7.7 - 15.4
1536-well Solid Flat Bottom	1.53 x 1.53	0.023	2.3 x 10 <sup>3</sup>	12.5	5 - 8	35.3	3.5 x 10 <sup>6</sup>	7.7 - 15.4

\*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.

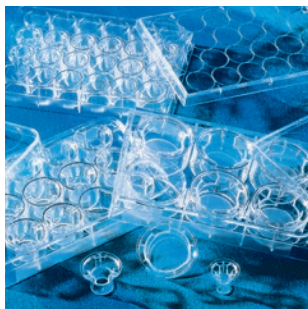
For Falcon® 384- and 1536-well microplates, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).

For 384- and 1536-well microplates, see the **Microplates Product Selection Guide** (CLS-C-DL-MP-014).

For 384- and 1536-well microplates with other surfaces, see the **Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide** (CLS-C-DL-AC-012).



# Transwell® Permeable Supports



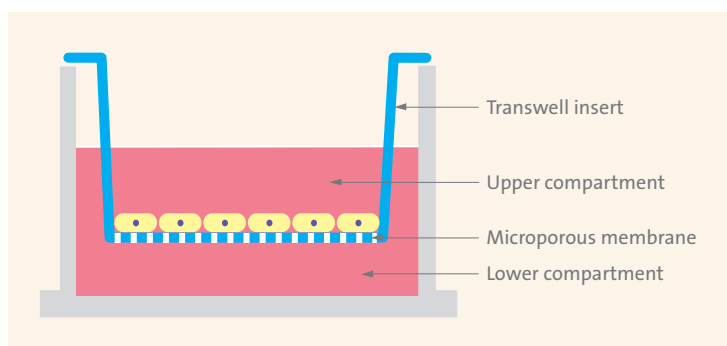
Permeable supports, also known as cell culture inserts, are an essential tool for the study of both anchorage-dependent and independent cell lines.

You can use cell culture inserts to:

- ▶ Produce a cell culture environment that closely resembles an *in vivo* state
- ▶ Allow polarized cells to carry out metabolic activities in a more natural manner because the cells feed both apically and basolaterally
- ▶ Co-culture cells with or without cell-to-cell contact
- ▶ Design a diversity of experiments using various pore sizes, membrane types, and coatings

This selection guide will help you choose the right combination of membrane type, pore size, format, and surface treatment to create a cell culture environment that more closely mimics the *in vivo* environment you desire.

## Create a More Natural Environment for Your Cells



The unique, self-centered hanging design of Transwell inserts prevents medium wicking between the insert and outer well. The design also permits access to the lower compartment through windows in the insert wall, as well as undamaged co-culturing of cells in the lower compartment.

## Transwell Permeable Supports: a Laboratory Standard

Transwell inserts are convenient, ready-to-use permeable support devices pre-packaged in standard multiple well plates. The unique, self-centered hanging design prevents medium wicking between the insert and outer well. Transwell inserts are available in a wide variety of sizes, membrane types, and configurations, and they are backed by extensive citations, protocols, and technical support—all of which has helped to make them the leading brand of cell culture insert for more than 25 years.

Follow these four steps to select the optimal insert for your research.

### 1. Select a Membrane

Permeable supports are available in three materials of construction:

#### **PC (Polycarbonate)**

Transwell® Permeable Supports are available in a broad range of pore sizes from 0.4 to 8.0  $\mu\text{m}$ . This high pore density membrane is suitable for a variety of applications. It allows for maximum diffusion when studying transport, secretions, or drug uptake.

#### **PET (Polyester or Polyethylene Terephthalate)**

Transwell-Clear inserts permit sufficient optical transparency for visualization of cell outlines by phase contrast microscopy.

#### **PTFE (Polytetrafluoroethylene)**

Collagen-coated PTFE membranes are available in limited pore sizes (0.4  $\mu\text{m}$  and 3.0  $\mu\text{m}$ ). These coated membranes promote cell attachment and allow cells to be visualized during culture.

Consult the product specification tables for more information.

## 2. Select a Pore Size

In general, smaller pore sizes (0.4  $\mu\text{m}$  and 1.0  $\mu\text{m}$ ) are used for culturing cells, co-culture applications, and drug transport studies. Larger pore sizes (3.0  $\mu\text{m}$  to 8.0  $\mu\text{m}$ ) are recommended for chemotaxis and angiogenesis applications. Please refer to the Applications guide for more information.

Application	Cell Type	Pore Size ( $\mu\text{m}$ )
Angiogenesis	Endothelial, hmvec, huvec	3.0
Co-culture	Stem, neuronal, and various others	0.4, 1.0
Epithelial Cell Polarity	Epithelial cells	0.4
Migration	Endothelial, HUVEC, HMVEC	3.0
	Neutrophils, PMNs	3.0
	Lymphocytes, macrophages, monocytes	3.0, 5.0
	Neuronal cells	3.0
	Dendritic cells	3.0, 5.0, 8.0
	Neurite outgrowth	1.0, 3.0
	Epithelial fibroblasts	8.0
	Leukocytes	3.0, 5.0
	Smooth muscle	8.0
Invasion	Melanoma	8.0
	Glioma	8.0
	Lymphoma, Jurkat	5.0, 8.0
	Osteoblasts	8.0
	Breast cancer	5.0, 8.0
	Endothelial	3.0, 5.0, 8.0
Tissue Engineering	Human skin model	0.4, 3.0
Toxicity Testing	Mouse fibroblasts	3.0
	Human lung	0.4
Transport and Permeability Studies	Caco-2	0.4, 1.0
	MDCK	0.4, 1.0

## 3. Select a Format

- Individual inserts are used with 6-, 12-, and 24-well multiple well plates. A large, single-well format is also available in a 100 mm dish.
- HTS insert plates are available in either 24- or 96-well formats with special receiver plates and single-well reservoirs to facilitate automation and ease of handling.
- Snapwell™ inserts are designed for use with diffusion or Ussing chambers.
- Netwell® inserts are used as tissue carriers or explants at the air-media interface. The inserts are available in 6- or 12-well plates.

### Growth Area Guide for Transwell® Inserts

Insert Diameter (mm)*	Multiple Well Plate or Dish Style	Insert Membrane Growth Area ( $\text{cm}^2$ )
4.26	96-well	0.143
6.5	24-well	0.33
12	12-well	1.12
24	6-well	4.67
75	100 mm dish	44

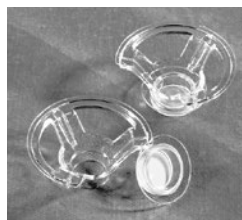
\*Values are reported as nominal and may vary due to inherent variability of our manufacturing process. To ensure success, we recommend that researchers validate their methods independent from our reported values.



Individual inserts for 6-, 12-, or 24-well plates or 100 mm dishes



HTS insert plates for automation and ease of handling



Snapwell inserts for use in diffusion or Ussing chambers

## INDIVIDUAL TRANSWELL® INSERTS

### Characteristics of Individual Transwell Inserts

Pore Size (µm)	0.4	0.4	3.0	3.0	5.0	8.0	8.0
Membrane	PET	PC	PET	PC	PC	PC	PET
Pore Density	$4 \times 10^6$	$1 \times 10^8$	$2 \times 10^6$	$2 \times 10^6$	$4 \times 10^5$	$1 \times 10^5$	$1 \times 10^5$
Opacity	Clear	Translucent	Clear	Translucent	Translucent	Translucent	Clear
1-well		■		■			
6-well	■	■	■	■			
12-well	■	■	■	■			
24-well	■	■	■	■	■	■	■



24 mm and 6.5 mm Transwell inserts

### Transwell Polycarbonate (PC) Membrane Inserts

- ▶ 10 µm thick translucent membrane
- ▶ Pore sizes ranging from 0.4 µm to 8 µm diameters
- ▶ Treated for optimal cell attachment
- ▶ Supplied in multiple well plates
- ▶ Membrane must be stained for cell visibility
- ▶ Sterile



12 mm polycarbonate Transwell inserts (Cat. No. 3401)



75 mm polycarbonate Transwell insert (Cat. No. 3419)

Cat. No.	Description	Membrane Pore Size (µm)	Qty/Pk	Qty/Cs
3412	Inserts in 6-well plates	0.4	6/plate	24
3414	Inserts in 6-well plates	3.0	6/plate	24
3428	Inserts in 6-well plates	8.0	6/plate	24
3401	Inserts in 12-well plates	0.4	12/plate	48
3402	Inserts in 12-well plates	3.0	12/plate	48
3413	Inserts in 24-well plates	0.4	12/plate*	48
3415	Inserts in 24-well plates	3.0	12/plate*	48
3421	Inserts in 24-well plates	5.0	12/plate*	48
3422	Inserts in 24-well plates	8.0	12/plate*	48
3419	Inserts in 100 mm dish	0.4	1/dish	12
3420	Inserts in 100 mm dish	3.0	1/dish	12

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

### Transwell-Clear Polyester (PET) Membrane Inserts

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



24 mm PET Transwell inserts

Cat. No.	Description	Membrane Pore Size (µm)	Qty/Pk	Qty/Cs
3450	Inserts in 6-well plates	0.4	6/plate	24
3452	Inserts in 6-well plates	3.0	6/plate	24
3460	Inserts in 12-well plates	0.4	12/plate	48
3462	Inserts in 12-well plates	3.0	12/plate	48
3470	Inserts in 24-well plates	0.4	12/plate*	48
3472	Inserts in 24-well plates	3.0	12/plate*	48
3464	Inserts in 24-well plates	8.0	12/plate*	48

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



All Transwell-COL Collagen-coated inserts are individually packaged and each case includes the appropriate multiple well plate.

### Transwell®-COL Collagen-coated Membrane Inserts\*

Transwell-COL collagen-coated inserts have a transparent (when wet) collagen-treated PTFE membrane that promotes cell attachment and spreading, while allowing cells to be visualized during culture. The coating process covers each fibril of the matrix, thereby retaining the porosity of the membrane.

- ▶ Transparent, Collagen-coated PTFE membrane
- ▶ Promotes cell attachment and spreading
- ▶ Equimolar mixture of Collagen type I and III
- ▶ Individually packaged
- ▶ Multiple well plates included in each case
- ▶ Sterile

Cat. No.	Description	Membrane Pore Size (μm)	Qty/Pk	Qty/Cs
3491	Inserts and 6-well plates	0.4	1	24
3492	Inserts and 6-well plates	3.0	1	24
3493	Inserts and 12-well plates	0.4	1	24
3494	Inserts and 12-well plates	3.0	1	24
3495**	Inserts and 24-well plates	0.4	1	24
3496**	Inserts and 24-well plates	3.0	1	24

\*Includes inserts packaged separately with multiwell plates.

\*\*6.5 mm diameter inserts packaged separately with two 24-well plates.

### Snapwell™ Inserts\*

The Snapwell insert is a modified Transwell culture insert that contains a 12 mm diameter tissue culture-treated membrane supported by a detachable ring. The inserts are primarily used for transport and electrophysiological studies. Once cells are grown to confluence, this ring-supported membrane can be placed into either vertical or horizontal diffusion or Ussing chambers.

#### Characteristics of Snapwell Insert Membranes

Pore Size (μm)	0.4	0.4
Membrane	PET	PC
Pore density	4 x 10 <sup>6</sup>	1 x 10 <sup>8</sup>
Opacity	Clear	Translucent
Inserts for 6-well plates	■	■

Cat. No.	Description	Membrane Pore Size (μm)	Qty/Pk	Qty/Cs
3407	PC inserts in 6-well plates	0.4	6	24
3801	Clear PET inserts in 6-well plates	0.4	6	24

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



Polycarbonate Snapwell Inserts



Polyester Snapwell Inserts

For permeable support inserts, see the **Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide** (CLS-C-DL-AC-012).

For Falcon® uncoated individual inserts, see the **Falcon Product Selection Guide** (CLS-F-PSG-001) or the **Permeable Supports Selection Guide** (CLS-CC-027).



## TRANSWELL® SUPPORT SYSTEMS

### HTS Transwell-24 Permeable Supports



HTS Transwell-24 insert plates

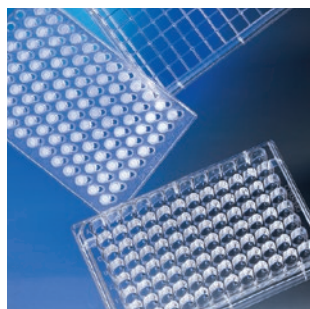
HTS insert plates are arrays of individual cell culture inserts connected by a rigid, robotics-friendly holder. This single-unit design makes insert plates ideal for running automated, high throughput drug transport (Caco-2 cells) cell toxicity studies or cell migration and invasion studies.

- ▶ The HTS Transwell-24 permeable support has an array of 24 wells with membrane inserts connected by a rigid, robotics-friendly tray that enables all 24 Transwell supports to be handled as a single unit.
- ▶ Cell growth area is 0.33 cm<sup>2</sup>/well.
- ▶ Choice of either polyester (PET) membrane (0.4 µm pore size) or polycarbonate (PC) membrane (0.4 µm and 3.0 µm pore sizes)
- ▶ Treated for optimal cell attachment
- ▶ Individual pack has two HTS Transwell-24 units loaded into two open reservoir trays and two individually wrapped 24-well plates.
- ▶ Bulk pack has 12 HTS Transwell-24 units loaded into 24-well plates only. Reservoirs may be purchased separately.
- ▶ Sterile

#### Characteristics of HTS Insert Plates

Pore Size (µm)	0.4	0.4	1.0	3.0	5.0	8.0
Membrane	PET	PC	PET	PC	PC	PET
Pore Density	4 x 10 <sup>6</sup>	1 x 10 <sup>8</sup>	1.6 x 10 <sup>6</sup>	2 x 10 <sup>6</sup>	4 x 10 <sup>5</sup>	1 x 10 <sup>5</sup>
Opacity	Clear	Translucent	Clear	Translucent	Translucent	Clear
24-well	■	■	■	■		
96-well		■	■	■	■	■

Cat. No.	Description	Membrane Pore Size (µm)	Qty/Pk	Qty/Cs
3396	HTS Transwell-24, individual, polycarbonate (PC)	0.4	1	2
3397	HTS Transwell-24, bulk, PC	0.4	12	12
3398	HTS Transwell-24, individual, PC	3.0	1	2
3399	HTS Transwell-24, bulk, PC	3.0	12	12
3395	HTS Transwell nontreated reservoir	—	12	48
3378	HTS Transwell-24, bulk, PET	0.4	12	12
3379	HTS Transwell-24, individual, PET	0.4	1	2



HTS Transwell-96 insert plates

### HTS Transwell®-96 Permeable Support Systems and Plates

- ▶ The HTS Transwell-96 permeable support has an array of 96-wells with membrane inserts connected by a rigid, robotics-friendly tray that enables all 96 inserts to be handled as a single unit.
- ▶ Choice of either polyester (PET) membrane (0.4  $\mu\text{m}$ , 1.0  $\mu\text{m}$ , and 8.0  $\mu\text{m}$  pore sizes) or polycarbonate (PC) membrane (0.4  $\mu\text{m}$ , 3.0  $\mu\text{m}$ , and 5.0  $\mu\text{m}$  pore sizes)
- ▶ 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
- ▶ The reservoir plate allows for simultaneous feeding of 96 wells and comes with a removable media stabilizer to reduce the risk of spills during handling
- ▶ The receiver plate isolates each well to enable 96 individual assays.
- ▶ Sterile
- ▶ The HTS Transwell-96 systems (0.4  $\mu\text{m}$  PC, 0.4  $\mu\text{m}$  PET, and 1.0  $\mu\text{m}$  PET) are packaged with the 96-well insert plate in a reservoir plate and includes the 96-well receiver plate with lid.
- ▶ The HTS Transwell-96 plates (3.0 and 5.0  $\mu\text{m}$  PC, 8.0  $\mu\text{m}$  PET) are packaged with the 96-well insert plate in the 96-well receiver plate with lid. Reservoir plates may be purchased separately.

Cat. No.	Description	Membrane Pore Size ( $\mu\text{m}$ )	Qty/ Pk	Qty/ Cs
3381	HTS Transwell-96 system, reservoir and receiver plates with 2 lids, PC	0.4	1	1
3391	HTS Transwell-96 system, reservoir and receiver plates with 2 lids, PC	0.4	1	5
7369	HTS Transwell-96 System reservoir and receiver plates with 2 lids, PET	0.4	5	5
3380	HTS Transwell-96 system, reservoir and receiver plates with 2 lids, PET	1.0	1	1
3392	HTS Transwell-96 system, reservoir and receiver plates with 2 lids, PET	1.0	1	5
3385	HTS Transwell-96 well plate, receiver plate and lid, individual, PC	3.0	1	2
3386	HTS Transwell-96 well plate, receiver plate and lid, bulk, PC	3.0	4	8
3387	HTS Transwell-96 well plate, receiver plate and lid, bulk, PC	5.0	4	8
3388	HTS Transwell-96 well plate, receiver plate and lid, individual, PC	5.0	1	2
3374	HTS Transwell-96 well plate, receiver plate and lid, individual, PET	8.0	1	2
3384	HTS Transwell-96 well plate, receiver plate and lid, bulk, PET	8.0	4	8
3382	HTS Transwell-96 receiver plate with lid, standard tissue culture-treated	—	10	10
3383	HTS Transwell-96 reservoir plate media stabilizer and lid	—	10	10
3583	HTS Transwell-96 black receiver plate with lid, standard tissue culture-treated	—	10	10
3783	HTS Transwell-96 white receiver plate and lid, standard tissue culture-treated	—	10	10



### Netwell™ Inserts

Netwell Inserts have polyester (PET) mesh bottoms attached to a polystyrene ring or housing. They are used as tissue carriers, supports and strainers for culture of small organs, tissue slices, or explants at the air-media interface. They can be used to coarse filter tissue homogenates, cell suspensions, or microcarriers. Accessories allow them to be used as a handy carrier for immunocytochemical staining of tissue culture slices.

#### Characteristics of Netwell Inserts

Mesh Size (μm)	74	440
Mesh Material	PET	PET
Sterile	Yes	Yes
Inserts for 6-, 12-, and 24-well plates	■	■

Cat. No.	Description	Membrane	Membrane Pore Size (μm)	Qty/Pk	Qty/Cs
3477	Inserts in 12-well plates	PET	74	12/plate	48
3478	Inserts in 12-well plates	PET	440	12/plate	48
3479	Inserts in 6-well plates	PET	74	6/plate	48
3480	Inserts in 6-well plates	PET	440	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

Cat. No.	Description	Qty/Cs
3517	Netwell reagent tray, black	200
3519	Netwell reagent tray, white	200
3520	Netwell 12-well carrier kit for 15 mm inserts	8
3521	Netwell 6-well carrier kit, for 24 mm inserts	8

## Culture Tubes



- ▶ Manufactured from optically clear polystyrene
- ▶ Threaded plug seal caps prevent leakage
- ▶ Tissue culture-treated tubes supplied racked
- ▶ Untreated tubes supplied bulk packed
- ▶ Sterile
- ▶ Nonpyrogenic

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

For Falcon® tubes, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).

## Cell Scrapers and Lifters



Cell lifter (Cat. No. 3008)

- ▶ 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 (especially stem cells) in dishes.
- ▶ Cell scrapers designed for use in flasks
- ▶ Individually wrapped
- ▶ Sterile
- ▶ Nonpyrogenic



Cell scraper, small (Cat. No. 3010)

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

For Falcon cell scrapers, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).



# Cryogenic Vials and Accessories



External thread cryogenic vials

## External Thread Cryogenic Vials

- ▶ Manufactured from polypropylene to withstand temperatures down to -196°C
- ▶ Black graduations with large white marking spot
- ▶ Vials have a silicone washer for a secure seal.
- ▶ Vials may be color-coded with inserts.
- ▶ Self-standing vials have a special base design, allowing them to be locked into cryogenic rack and tray (Cat. Nos. 430525 or 431131) for single-handed manipulation.
- ▶ Free foam rack with each case
- ▶ RNase-/DNase-free
- ▶ Sterile
- ▶ Nonpyrogenic

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



Internal thread cryogenic vials

## Internal Thread Cryogenic Vials

- ▶ Manufactured from polypropylene to withstand temperatures down to -196°C
- ▶ Black graduations with large marking spot
- ▶ Vials have a silicone washer for a secure seal.
- ▶ 2 mL self-standing vials are available in five cap colors.
- ▶ Vials may be color coded with inserts (see below).
- ▶ Self-standing vials have a special base design allowing them to be locked into cryogenic rack and tray (Cat. Nos. 430525 or 431131) for single-handed manipulation.
- ▶ Free foam rack with each case
- ▶ RNase-/DNase-free
- ▶ Sterile
- ▶ Nonpyrogenic

## Internal Thread Color Cap Cryogenic Vials

Cat. No.	Cap Color	Capacity (mL)	Style	Self-standing	Type	Qty/Pk	Qty/Cs
431416	Assorted	2.0	Round bottom	Yes	Washer	50	500
431417	Yellow	2.0	Round bottom	Yes	Washer	50	500
431418	Blue	2.0	Round bottom	Yes	Washer	50	500
431419	Green	2.0	Round bottom	Yes	Washer	50	500
431420	Red	2.0	Round bottom	Yes	Washer	50	500
431421	White	2.0	Round bottom	Yes	Washer	50	500



Internal thread color cap 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.

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 Orange Cap Cryogenic Vials**

Cat. No.	Capacity (mL)	Style	Self-standing	Type	Qty/Pk	Qty/Cs
430487	1.2	Conical bottom	Yes	Washer	50	500
430488	2.0	Round bottom	Yes	Washer	50	500
430489	2.0	Round bottom	No	Washer	50	500
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
431386	2.0	Round bottom	Yes	Washer	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.

**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.



Assorted colors of polypropylene cap inserts

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**

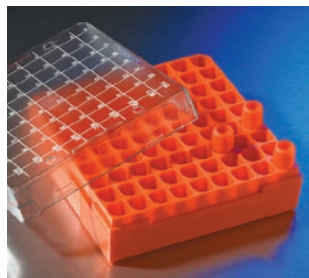
- ▶ Reusable racks are designed for use with most cryogenic vials
- ▶ Cat. No. 430525 has a locking feature for use with all Corning self-standing vials



Cryogenic vial racks

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 to 2 mL vials	5	10
431120	81 count (9 x 9 array) cryogenic box, for 4 to 5 mL vials	5	10
431121*	100 count (10 x 10 array) cryogenic box, for 1 to 2 mL vials	5	10

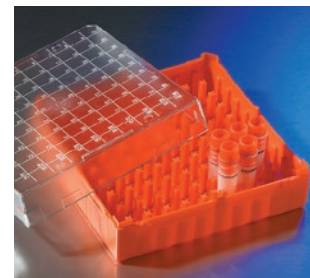
\*431121 accepts internally threaded cryogenic vials only.



Cryogenic storage box  
(Cat. No. 431119)



Cryogenic storage box  
(Cat. No. 431120)



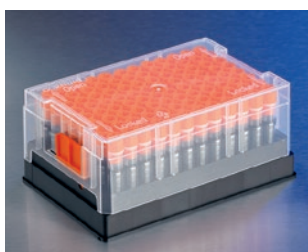
Cryogenic storage box  
(Cat. No. 431121)

## Corning® 96 1D/2D Bar Coded Cryogenic Vials

### A System Solution for Automated Sample Management

The 1D/2D storage line offers a superior storage solution designed to provide maximum identification. Features include:

- ▶ Temperature-resistant polypropylene vials withstand temperatures down to -196°C.
- ▶ Maximum identification – Synchronized 2D and linear bar code along with marking spot
- ▶ Maximum information – 14 x 14 dot 2D bar code
- ▶ Bar code stability – Laser-etched for permanent identification
- ▶ Compound compatibility – Universal inert polypropylene construction throughout



#### Cryogenic Vials

Cat. No.	Description	Qty/Pk	Pk/Cs	Qty/Cs
8500	96 1D/2D bar coded cryogenic vials, 1.3 mL, without screw caps, bulk pack	96	10	960 tubes
8501	96 1D/2D bar coded cryogenic vials, 1.3 mL, without screw caps, racked, with cover	96/rack	10 racks	960 tubes
8502	96 1D/2D bar coded cryogenic vials, 1.3 mL, with screw caps, bulk pack	96	10	960 tubes
8503	96 1D/2D bar coded cryogenic vials, 1.3 mL, with screw caps, racked, with cover	96/rack	10 racks	960 tubes

#### Compatible Caps and Rack

8504	96 cryogenic vial screw cap, polypropylene with O-ring, bulk pack	96	50	4,800 caps
8505	96 cryogenic vial screw cap, polypropylene, with O-ring, on mat, 96 caps per mat, clear, with cover	480	10	4,800 caps
8506	Thermoplastic elastomer 96 cryogenic vial septum cap, bulk pack	96	100	9,600 caps
8507	Thermoplastic elastomer 96 cryogenic vial septum cap on mat, 96 caps per mat	960	5	4,800 caps
8508	Empty racks with lids for 96 screw capped or thermoplastic elastomers capped cryogenic vials	5 racks	2	10 racks

## Corning 384 Bar Coded Cryogenic Vials

### A System Solution for Automated Sample Management

The 2D storage line offers a superior storage solution designed to provide maximum identification.

- ▶ Maximum information – 14 x 14 dot 2D bar code
- ▶ Bar code stability – Laser-etched for permanent identification
- ▶ Compound compatibility – Universal inert polypropylene construction throughout



#### Cryogenic Vials

Cat. No.	Description	Qty/Pk	Pk/Cs	Qty/Cs
8509	384 2D bar coded cryogenic vials, round, without plug caps, racked	384/rack	20	7,680
8510	384 2D bar coded cryogenic vials, square, racked	384/rack	20	7,680

#### Compatible Caps and Rack

8511	384 cryogenic vials plug cap for round tube, bulk pack	384	100	38,400
8512	384 cryogenic vials plug cap on mats for round tube, 384 caps per mat	3,840	10	38,400
8513	Empty racks with lids for 384 round or square cryogenic vials	1 rack	20	20

# Technical Appendix

## Corning® Cell Culture Surfaces

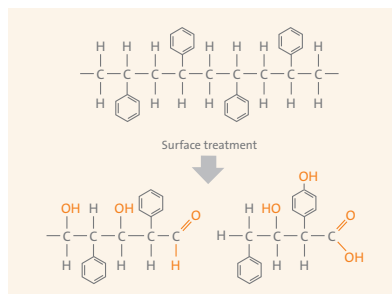
### Introduction

Corning currently offers six polystyrene-based surfaces (Table 1) for growing cells, including the Corning CellBIND® surface.

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 (non-wettable) 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 technical section of our website.

### Corning CellBIND Surface

The Corning CellBIND surface 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. Developed by Corning scientists, this technology uses a novel microwave plasma process for treating the culture surface. This process improves cell attachment by incorporating significantly more oxygen into the cell culture surface than traditional plasma or corona discharge treatments, rendering it more hydrophilic (wettable) and increasing the stability of the surface.



**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).

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.

Corning CellBIND surface benefits:

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

The Corning CellBIND surface is available on flasks, multiple well plates, Corning CellSTACK® culture chambers, roller bottles, 96-well microplates, 384-well microplates, and dishes.

### Corning Synthemax® Self-coating Substrate

The Corning Synthemax II-SC Substrate is a peptide-copolymer powder that readily dissolves in water, for use as a cell adhesion promoting surface coating for various stem cell lines. Corning Synthemax II-SC Substrate can be coated onto any culture vessel format providing additional flexibility to end users.

**Table 1. Corning Cell Culture Surfaces**

Corning Surface	Binding Interaction	Sample Properties
Corning CellBIND surface-modified polystyrene	Hydrophilic and ionic (negatively charged)	Improves cell attachment and binding to polystyrene
Standard tissue culture-treated polystyrene	Hydrophilic and ionic (negatively charged)	Allows cell attachment and binding to polystyrene
Untreated polystyrene	Hydrophobic	Significantly reduces the attachment of most cells
Ultra-Low Attachment-coated polystyrene	Hydrophilic and non-ionic	Hydrogel layer prevents the attachment of almost all cells
Poly-D-Lysine-coated polystyrene	Hydrophilic and ionic (positively charged)	Improves cell attachment and binding to polystyrene
Synthemax® II-SC substrate	Synthetic peptide surface coating	Mimics cells' natural environment with extracellular matrix-derived cell adhesion promoting peptide
Corning Osteo Assay surface	Crystalline calcium phosphate coating	Mimics <i>in vivo</i> bone-like surface for <i>in vitro</i> bone cell assays



### Corning® Osteo Assay Surface

The Corning Osteo Assay surface is an inorganic crystalline calcium phosphate coating on a polystyrene plate designed to mimic *in vivo* bone environment. The surface is intended to facilitate a variety of bone cell assays including immunofluorescent staining, tartrate resistant acid phosphatase (TRAP), and surface resorption assays for osteoclasts. The surface is available in a convenient, ready-to-use, sterile, multiple well plate, 1 x 8 Corning Stripwell™ microplate, and is stable at room temperature.

The Osteo Assay surface is useful for:

- ▶ Cell growth and differentiation of precursor cells to osteoclast or blast
- ▶ Direct readout of osteoclast and osteoblast cell function and differentiation assays such as TRAP staining, pit resorption, and bone nodule formation
- ▶ Targeted drug screening for bone cell activity
- ▶ Real time imaging for high content analysis
- ▶ Quantitative assay for enzymatic activity by sampling the cell culture supernatant
- ▶ Ideal for bone and metastatic cells co-cultures (Figure 2)

### Corning Ultra-Low Attachment-coated Polystyrene Surface

The 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, noncytotoxic, biologically inert, and nondegradable. Corning offers the Ultra-Low Attachment surface on dishes, plates, flasks, and Corning CellSTACK® culture chamber 1-stack.

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 3). This surface has also been shown to inhibit the attachment and activation of macrophages and neutrophils.

Ultra-Low Attachment surface culture vessels are useful for:

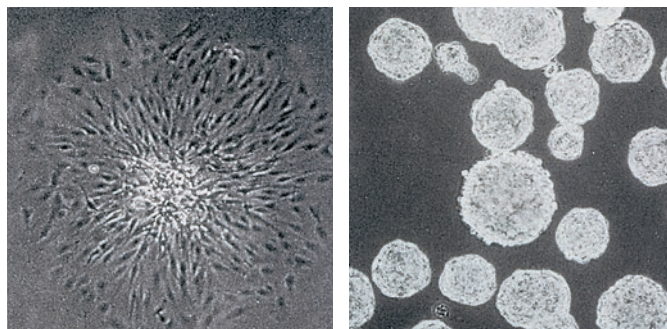
- ▶ Studying tissue-specific functions of certain cancer cells (i.e., MCF-7 breast cancer cells)
- ▶ Preventing stem cells from attachment-mediated differentiation
- ▶ Selectively culturing tumor or virally transformed cells as unattached colonies (substitute for soft agar assays)

### 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 kDa 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



**Figure 2.** Corning Osteo Assay surface promotes co-culture of metastatic breast cancer cell line, MDA MB231 (small light pink stained cells) and multinucleated osteoclast (dark pink)



**Figure 3.** 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).

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-well and 384-well microplates

### 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.

### 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 for use in situations where cell attachment must be kept to an absolute minimum.

## Characteristics of Corning® Plasticware

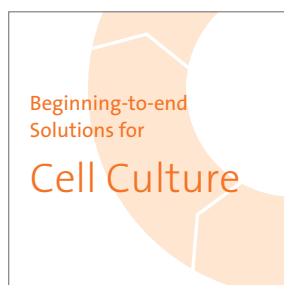
Portions of this table courtesy of Modern Plastics Encyclopedia. Most data are from tests by A.S.T.M. methods. Tables show averages or ranges. Many properties vary with manufacturer, formulation, testing laboratory, and the specific operating conditions.

	Polystyrene	Polyethylene (High Density)	Polypropylene	Polycarbonate	Nylon	Polytetra- fluorethylene (PTFE)	Polyethylene Terephthalate (PET)
<b>Physical Characteristics</b>							
<b>Basic Properties</b>	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	Biologically inert, hard, tough, excellent optical qualities
<b>Clarity</b>	Clear	Opaque	Translucent	Clear	Opaque	Opaque	Clear
<b>Autoclave Results</b>	Melts	May	Withstands distort	Withstands several cycles	OK one cycle	OK	Melts
<b>Heat Distortion Point</b>	147°F - 175°F 64°C - 80°C	250°F 121°C	275°F 135°C	280°F - 290°F 138°C - 143°C	300°F - 356°F 150°C - 180°C	250°F 121°C	158°F 70°C
<b>Burning Rate</b>	Slow	Slow	Slow	Self-extinguishing	Self-extinguishing	None	—
<b>Effects of Laboratory Reagents</b>							
<b>Weak Acids</b>	None	None	None	None	None	None	None
<b>Strong Acids</b>	Oxidizing acids attack	Oxidizing acids attack	Oxidizing acids attack	May be attacked	Attacked	None	Oxidizing acids attack
<b>Weak Alkalies</b>	None	None	None	None	None	None	None
<b>Strong Alkalies</b>	None	None	None	Slowly attacked	None	None	Attacked
<b>Organic Solvents</b>	Soluble in aromatic chlorinated hydrocarbons	Resistant below 80°C	Resistant below 80°C	Soluble in chlorinated hydrocarbons; partly soluble in aromatics	Resistant	Resistant	Soluble in aromatic or chlorinated hydrocarbons
<b>Gas Permeability of Thin Wall Products*</b>							
<b>O<sub>2</sub></b>	Low	High	High	Very low	Very low	—	Very low
<b>N<sub>2</sub></b>	Very low	Low	Low	Very low	Very low	—	Very low
<b>CO<sub>2</sub></b>	High	Very high	Very high	Low	—	—	Low

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

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3001 .....	C9	3388 .....	C20	3496 .....	C18	8512 .....	C25	430663 .....	C23
3008 .....	C22	3391 .....	C20	3506 .....	C12	8513 .....	C25	430720U .....	C7
3010 .....	C22	3392 .....	C20	3512 .....	C12	10020 .....	C9	430725U .....	C7
3011 .....	C22	3395 .....	C19	3513 .....	C12	10024 .....	C9	430823 .....	C8
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3151 .....	C8	3401 .....	C17	3521 .....	C21	430157 .....	C22	431081 .....	C9
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