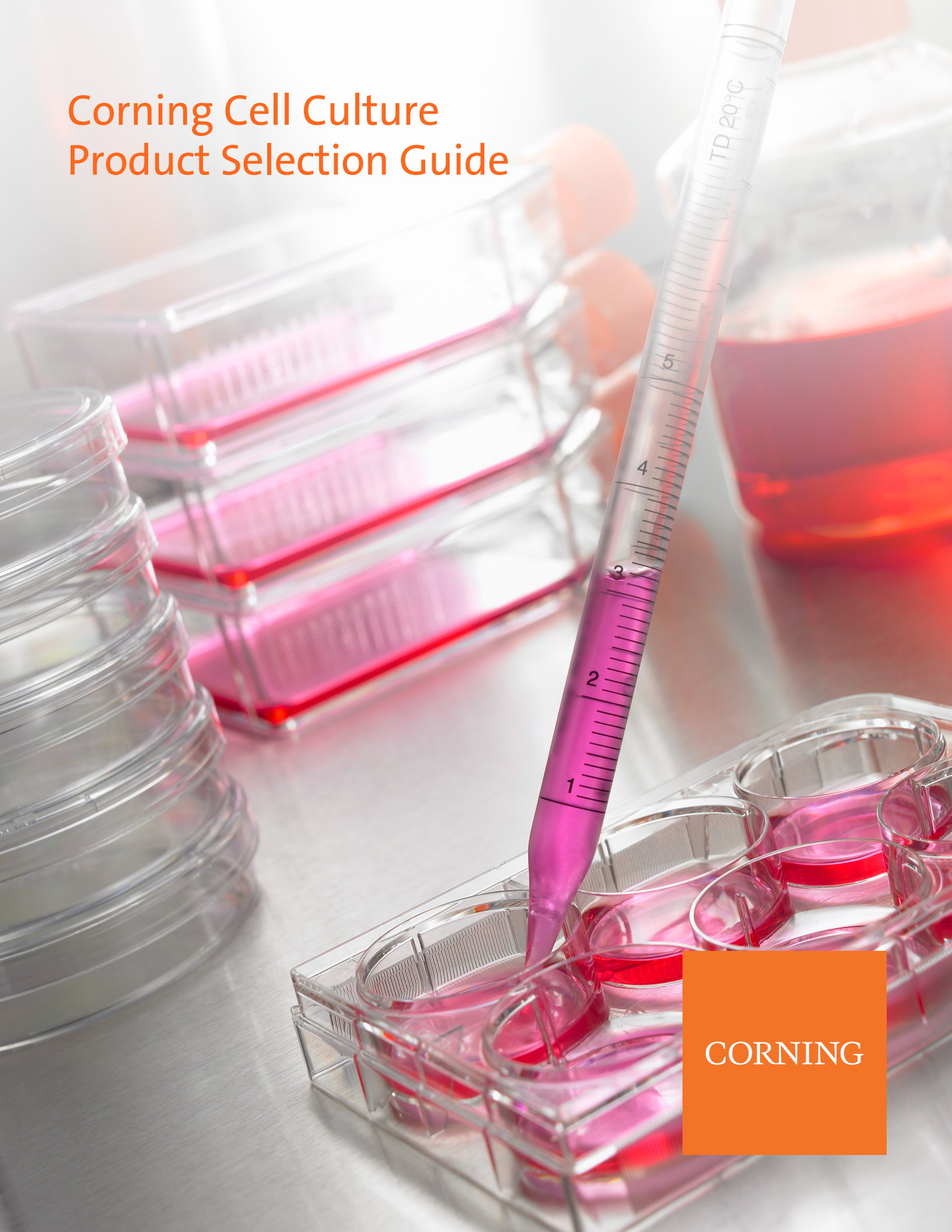


Corning Cell Culture Product Selection Guide



CORNING



Table of Contents

| | |
|--|----|
| Overview | 2 |
| Corning Surfaces | 3 |
| Cell Culture Flasks | 6 |
| Cell Culture Dishes | 9 |
| Multiwell Plates | 11 |
| Cell Culture Microplates | 12 |
| Corning® Transwell® Permeable Supports | 14 |
| Culture Tubes | 20 |
| Cell Scrapers and Lifters | 20 |
| Cryogenic Vials and Accessories | 21 |
| Cell Culture Filtration | 23 |
| Technical Appendix | 26 |
| Corning Cell Culture Surfaces | 26 |
| Characteristics of Corning Plasticware | 28 |
| Selecting the Best Filter for your Application | 29 |
| Index | 35 |

Product Ordering Information

For information on Purchasing Options, Terms and Conditions of Sale, Return and Repair Policies, and Warranty/Guarantee Registration, visit www.corning.com/how-to-buy.

Products may not be available in all markets.

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.

In addition, customers can request a Certificate of Quality at www.corning.com/lifesciences. 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.

ADDITIONAL QUALITY ASSURANCES

Nonpyrogenic Certification

Most Corning 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.

Lot Number Traceability

To ensure accurate lot number traceability in biotechnology research and production facilities, most Corning 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 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 cell 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 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
- ▶ Helps cells stay attached during assay processing

Surfaces for Reducing or Preventing Cell Attachment

Corning Ultra-Low Attachment (ULA)-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

| Corning Cell Culture Surfaces | Formats | | | | | | | |
|--|---------|--------|------------------|-------------|-------------------------------------|-----------------------------|--------------------|--------------|
| | Flasks | Dishes | Multiwell Plates | Microplates | Corning CellSTACK® Culture Chambers | Corning HYPERFlask® Vessels | Cell Culture Tubes | Self-coating |
| For enhancing cell attachment: | | | | | | | | |
| Original Tissue Culture (TC) surface | ■ | ■ | ■ | ■ | ■ | | ■ | |
| Corning CellBIND surface | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Poly-D-Lysine-coated surface | | | | ■ | | | | |
| For reducing or preventing cell attachment: | | | | | | | | |
| Ultra-Low Attachment surface | ■ | ■ | ■ | ■ | ■ | | | |
| For specialized cell needs: | | | | | | | | |
| Corning Synthemax surface | | | | | | | | ■ |

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

For other Corning surfaces, see the [Extracellular Matrices, Biologically Coated, and Permeable Support Inserts Product Selection Guide](#) (CLS-C-DL-AC-012).

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 (wetttable) 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
- ▶ Lot numbers for quality assurance and tracking
- ▶ Corning CellBIND surface logo differentiates from standard treatment cell culture products and avoids mix-ups
- ▶ Sterile
- ▶ Nonpyrogenic

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

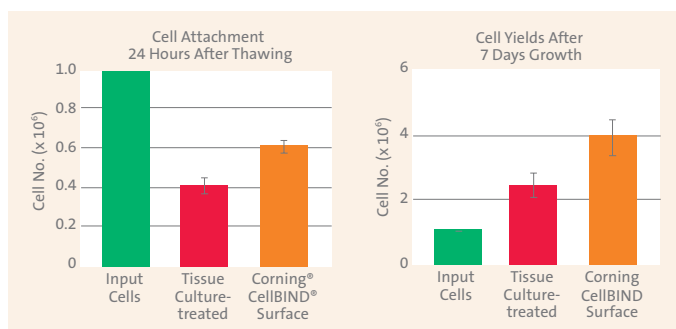


Figure 1. Left: Adherent cell recovery and growth of LNCaP cells 24 hours post-seeding. Data is average \pm standard error from 3 independent experiments. Right: Average \pm standard error from 3 independent experiments for 7 days of growth after initial attachment. From Enhanced Attachment of LNCaP Cells to the Corning CellBIND surface, (CLS-AN-048).

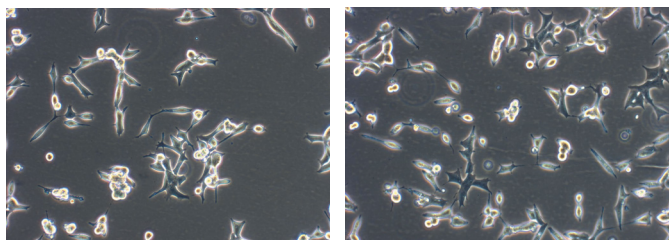
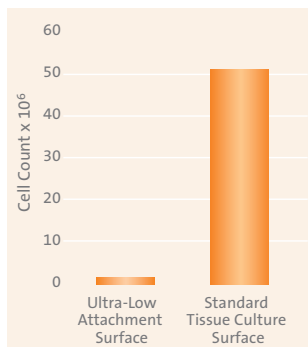


Figure 2. Attachment of LNCaP cells. Cells were thawed and plated onto the Corning CellBIND surface (right) or tissue culture-treated (left) T-25 flasks. 24 hours post-seeding a random field was viewed by light microscopy (100X magnification).

Corning CellBIND surface is available on flasks, multiwell plates, 96- 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 ULA surface vs. standard tissue culture-treated plates.

Vero cells plated at 2.6×10^6 cells per well grown for 4 days at 37°C in a 5% CO₂ environment show a 99% reduction in cellular attachment vs. standard tissue culture-treated product.



Ultra-Low Attachment Surface

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

The Ultra-Low Attachment (ULA) 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 ULA surface products:

- ▶ 6-well plate: 1.9 mL to 2.9 mL/well
- ▶ 24-well plate: 0.4 mL to 0.6 mL/well
- ▶ 96-well microplate: 0.1 mL to 0.2 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 cm² flask: 5 mL to 7.5 mL/flask
- ▶ 75 cm² flask: 15 mL to 22.5 mL/flask
- ▶ 636 cm² chamber: 127 mL to 191 mL/flask

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

For ULA surface microplates, see the **Microplates** section of this guide 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 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.
- ▶ ULA 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

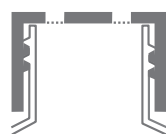
Flask Cap Styles



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, isolating the container it is placed on from the environment while providing consistent gas exchange. These caps are highly recommended for use in all CO_2 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:



25 cm² flask, canted neck, vent cap (Cat. No. 430639)



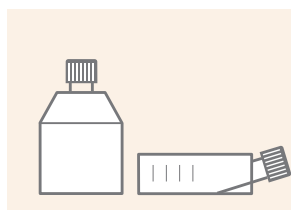
75 cm² U-shaped flask, canted neck, vent cap (Cat. No. 430641U)



75 cm² U-shaped flask, canted neck, phenolic style cap (Cat. No. 430725U)



150 cm² U-shaped flask, canted neck, plug seal cap (Cat. No. 430823)



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 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 cm² 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 |
| 3289 | CellBIND® | Rectangular | Canted | Vent | 20 | 200 |
| 4616 | ULA | Rectangular | Canted | Vent | 5 | 25 |
| 431463 | Not treated | Rectangular | Canted | Vent | 20 | 200 |

75 cm² 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 |
| 3290 | CellBIND | U-shaped | Canted | Vent | 5 | 100 |
| 3814 | ULA | U-shaped | Canted | Vent | 4 | 24 |

150 cm² Growth Area Flasks

| | | | | | | |
|--------|-------------|----------|--------|----------------|---|----|
| 430823 | TC-treated | U-shaped | Canted | Plug seal | 5 | 50 |
| 430824 | TC-treated | U-shaped | Canted | Phenolic-style | 5 | 50 |
| 430825 | TC-treated | U-shaped | Canted | Vent | 5 | 50 |
| 3291 | CellBIND | U-shaped | Canted | Vent | 5 | 50 |
| 431465 | Not treated | U-shaped | Canted | Vent | 5 | 50 |

Tip: Cell Culture Flask Application

Corning recommends 0.2 mL to 0.3 mL of medium per cm² of growth area.

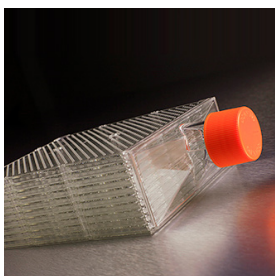
For technical cell culture application notes, visit www.corning.com/lifesciences.



175 cm² U-shaped flask, angled neck, vent cap (Cat. No. 431466)



225 cm² angled neck flask with vent cap (Cat. No. 431082)



1720 cm² Corning HYPERFlask vessel (Cat. No. 10024)

175 cm² Growth Area Flasks

| Cat. No. | Surface | Flask Style | Neck Style | Cap Style | Qty/Pk | Qty/Cs |
|----------|-------------|-------------|------------|----------------|--------|--------|
| 431079 | TC-treated | U-shaped | Angled | Plug seal | 5 | 50 |
| 431080 | TC-treated | U-shaped | Angled | Vent | 5 | 50 |
| 431085 | TC-treated | U-shaped | Angled | Phenolic-style | 5 | 50 |
| 431306* | TC-treated | Rectangular | Angled | Vent | 7 | 84 |
| 431328* | CellBIND® | Rectangular | Angled | Vent | 7 | 84 |
| 3292 | CellBIND | U-shaped | Angled | Vent | 5 | 50 |
| 431466 | Not treated | U-shaped | Angled | Vent | 5 | 50 |

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

225 cm² 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 |
| 3293 | CellBIND | Traditional | Angled | Vent | 5 | 25 |

1720 cm² Growth Area Corning HYPERFlask® Vessel

| Cat. No. | Description | Surface | Type | Qty/Pk | Qty/Cs |
|----------|---------------------|-------------|---------------------|--------|--------|
| 10024* | HYPERFlask vessel | CellBIND | Bar code, sterile | 4 | 24 |
| 10030 | HYPERFlask M vessel | CellBIND | Bar code, sterile | 1 | 4 |
| 10020 | HYPERFlask M vessel | CellBIND | Bar code, sterile | 4 | 4 |
| 10034 | HYPERFlask M vessel | CellBIND | Bar code, sterile | 4 | 24 |
| 10031 | HYPERFlask M vessel | Not treated | Bar code, sterile | 1 | 4 |
| 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 Flasks | Approximate Growth Area (cm ²) | Average Cell Yield* | Recommended Medium Volume (mL) |
|----------------------|--|------------------------|--------------------------------|
| 25 cm ² | 25 | 2.5 × 10 ⁶ | 5 - 7.5 |
| 75 cm ² | 75 | 7.5 × 10 ⁶ | 15 - 22.5 |
| 150 cm ² | 150 | 1.5 × 10 ⁷ | 30 - 45 |
| 175 cm ² | 175 | 1.75 × 10 ⁷ | 35 - 52.5 |
| 225 cm ² | 225 | 2.25 × 10 ⁷ | 45 - 67.5 |
| 1720 cm ² | 1720 | 2.5 × 10 ⁸ | 565 |

*Assumes an average yield of 1 × 10⁵ cells/cm² from a 100% confluent culture. Yields from many cell types can be lower than this.

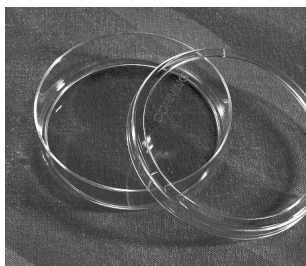
Tip: Cell Culture Flask Selection

The novel Corning HYPERFlask vessel offers high yield and high performance with 10 growth surfaces and 1720 cm² growth area in the same footprint as the 175 cm² flask.

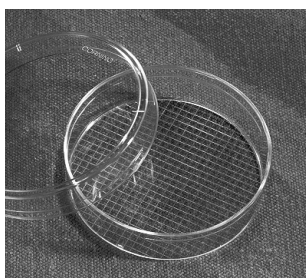
For Falcon® flasks, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).

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

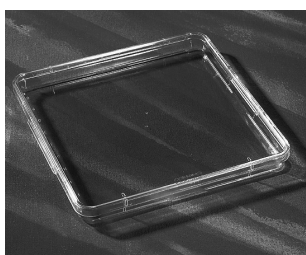
Cell Culture Dishes



100 mm dishes



60 mm dish, gridded

500 cm² cell culture dish, 245 mm

245 x 245 mm square bioassay dish

Treated Cell Culture Dishes

- ▶ Corning® CellBIND® surface is a novel cell culture treatment that increases surface wettability for more even and consistent cell attachment
- ▶ ULA surface dishes feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption, and cellular activation
- ▶ 10 dishes/pack 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 (cm ²) | Qty/Pk | Qty/Cs |
|----------|------------|-------------------|---------------------|--------------------------------|--------|--------|
| 3294 | CellBIND | 35 | 10 | 9 | 10 | 210 |
| 430165 | TC-treated | 35 | 10 | 9 | 20 | 500 |
| 430166 | TC-treated | 60 | 15 | 21 | 20 | 500 |
| 3295 | CellBIND | 60 | 15 | 21 | 7 | 126 |
| 3261 | ULA | 60 | 15 | 21 | 5 | 20 |
| 430196 | TC-treated | 60 with 2 mm grid | 15 | 21 | 20 | 500 |
| 4615 | ULA | 100 | 20 | 55 | 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 x 245 mm, square, 18 mm deep dish not treated, sterile | PBA Flexys™ and Genetix Q-Bot™ automated colony picking and gridding robots | 4 | 16 |
| 431272 | 245 x 245 mm, square, 18 mm deep dish not treated, sterile | AutoGen AutoGenesys, BioRobotics BioPick, BioGrid, TAS, and MicroGrid II high volume automated colony picking systems | 4 | 16 |
| 431301 | 245 x 245 mm, low profile, dish not treated, sterile | PBA Flexys, Genetix Q-Bot, BioRobotics BioPick automated colony picking and gridding robots | 5 | 20 |

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

Tips: Cell Culture Dish Application

- ▶ 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 cm² of growth area.

| Cat. No. | Dish Style* (mm) | Height (mm) | Approx. Growth Area (cm ²) | 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 [†] | 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 dish with interior bottom plate dimensions of 224 x 224 mm.

Expected Cell Yields and Recommended Medium Volumes

| Corning Dishes | Approximate Growth Area (cm ²) | Average Cell Yield* | Recommended Medium Volume (mL) |
|-----------------|--|------------------------|--------------------------------|
| 35 mm | 8 | 8.0 x 10 ⁵ | 1.6 - 2.4 |
| 60 mm | 21 | 2.1 x 10 ⁶ | 4.2 - 6.3 |
| 100 mm | 55 | 5.5 x 10 ⁶ | 11 - 16.5 |
| 150 mm | 152 | 1.52 x 10 ⁷ | 30.4 - 45.6 |
| 245 mm (square) | 500 | 5.0 x 10 ⁷ | 100 - 150 |

*Assumes an average yield of 1 x 10⁵ cells/cm² from a 100% confluent culture. Yields from many cell types can be lower than this.

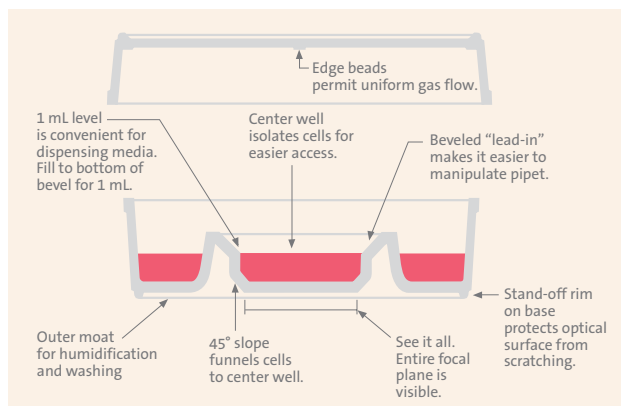
Corning® Costar® 60 mm Center Well Culture Dish

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



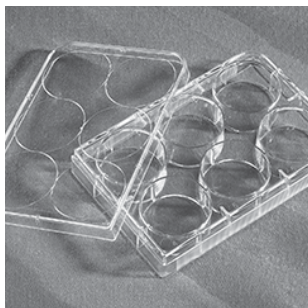
60 mm center well dish



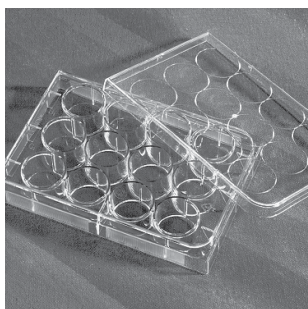
| Cat. No. | Size (mm) | Description (mm) | Center Well (mm) | Qty/Pk | Qty/Cs |
|----------|-----------|------------------|------------------|--------|--------|
| 3260 | 60 | 60 x 15 | 20 | 20 | 500 |

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

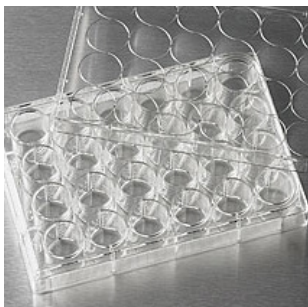
Multiwell Plates



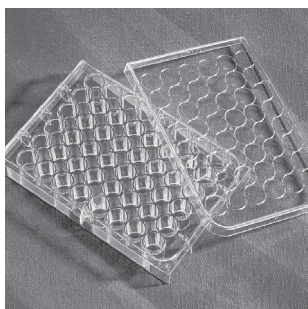
6-well culture plate



12-well culture plate



24-well culture plate



48-well culture plate

Corning® Costar® 6-, 12-, 24-, 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.
- ▶ ULA surface plates feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption, and cellular activation.
- ▶ Sterile
- ▶ Nonpyrogenic

6-well

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

12-well

| | | | | |
|------|-------------|----------------|---|-----|
| 3336 | 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 | 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 | ULA | Standard with hydrogel* | 1 | 24 |
| 3738 | Not treated | Standard clear | 5 | 100 |

48-well

| | | | | |
|------|------------|----------------|---|-----|
| 3338 | 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

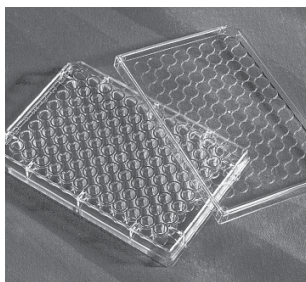
| Cell Culture Plates | Well Bottom Diameter (mm) | Single Well Only | | | | Entire Plate | | |
|---------------------|---------------------------|--|-----------------------|------------------------|---------------------|--|------------------------|---------------------|
| | | Approx. Growth Area (cm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

*Assumes an average yield of 1 x 10⁵ cells/cm² from a 100% confluent culture. Yields from many cell types can be lower than this.

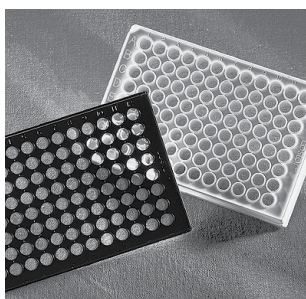
For Falcon® multiwell plates, see the **Falcon Product Selection Guide** (CLS-F-PSG-001).

For multiwell 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

- ▶ Non-reversible lids with condensation rings (except where noted)
- ▶ Individual alphanumeric codes for well identification, flat bottoms (except where noted)
- ▶ 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.
- ▶ ULA surface microplates feature a covalently bound hydrogel layer that minimizes cell attachment, protein absorption and cellular activation.
- ▶ 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.
- ▶ 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 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.

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 ²) | Average Cell Yield* | Total Well Volume (mL) | Working Volume (mL) | Approx. Growth Area (cm ²) | Average Cell Yield* | Working Volume (mL) |
| 96-well flat bottom | 6.4 | 0.32 | 3.2 x 10 ⁴ | 0.36 | 0.100 - 0.200 | 30.7 | 3.07 x 10 ⁶ | 9.6 - 19.2 |
| 96-well round bottom | 6.4 | NA [†] | NA [†] | 0.33 | 0.100 - 0.200 | NA [†] | NA [†] | 9.6 - 19.2 |
| 96-well V-bottom | 6.4 | 0.38 | 3.8 x 10 ⁴ | 0.29 | 0.100 - 0.200 | 36.5 | 3.65 x 10 ⁶ | 9.6 - 19.2 |
| 96 half area | 4.5 | 0.16 | 1.6 x 10 ⁴ | 0.19 | 0.050 - 0.100 | 15.4 | 1.54 x 10 ⁶ | 4.8 - 9.6 |

*Assumes an average yield of 1 x 10⁵ cells/cm² from a 100% confluent culture. Yields from many cell types can be lower than this.

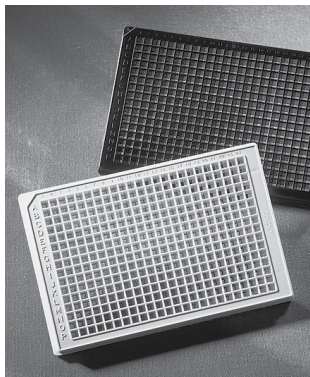
[†]Because these wells are round, the surface area available for cell attachment is dependent on the medium volume used.

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 bottom with lid
- ▶ 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 (PDL) 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.

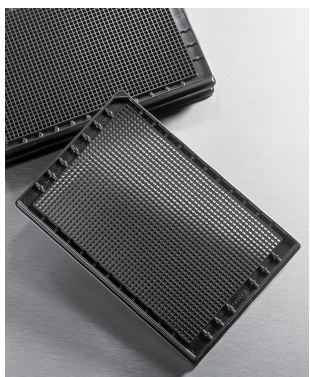
384-well Microplate Dimensions, Expected Cell Yields, and Recommended Medium Volumes

| Cell Culture Microplate | Well Bottom Diameter (mm) | Single Well Only | | | | Entire Microplate | | |
|-------------------------|---------------------------|---------------------------------------|-----------------------|------------------------|---------------------|---------------------------------------|------------------------|---------------------|
| | | Approx. Growth Area (cm^2) | Average Cell Yield* | Total Well Volume (mL) | Working Volume (mL) | Approx. Growth Area (cm^2) | Average Cell Yield* | Working Volume (mL) |
| 384-well standard | 2.7 x 2.7 [†] | 0.056 | 5.6 x 10 ³ | 0.125 | 0.025 - 0.050 | 21.5 | 2.15 x 10 ⁶ | 9.6 - 19.2 |
| 384-well low volume | 2.0 | 0.031 | 3.1 x 10 ³ | 0.050 | 0.005 - 0.040 | 12.0 | 1.2 x 10 ⁶ | 1.9 - 15.3 |

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

[†]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 bottom with lid
- ▶ 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.

1536-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^2) | Average Cell Yield* | Total Well Volume (mL) | Working Volume (mL) | Approx. Growth Area (cm^2) | Average Cell Yield* | Working Volume (mL) |
| 1536-well clear flat bottom | 1.63 x 1.63 | 0.025 | 2.5 x 10 ³ | 12.5 | 5 - 8 | 38.3 | 3.8 x 10 ⁶ | 7.7 - 15.4 |
| 1536-well flat bottom | 1.53 x 1.53 | 0.023 | 2.3 x 10 ³ | 12.5 | 5 - 8 | 35.3 | 3.5 x 10 ⁶ | 7.7 - 15.4 |

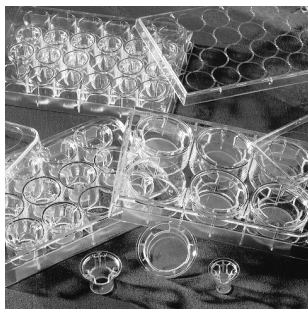
*Assumes an average yield of 1×10^5 cells/ cm^2 from a 100% confluent culture. Yields from many cell types can be lower than this.

For Falcon® 384-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).

Corning® Transwell® Permeable Supports



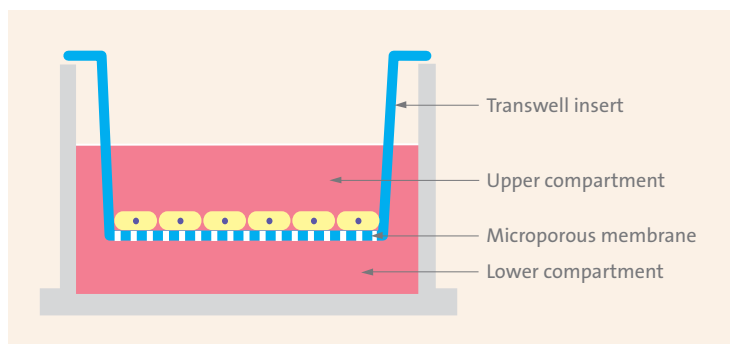
Permeable supports, also known as cell culture inserts, are an essential tool for the study of both anchorage-dependent and independent cell lines.

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 broad range 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 multiwell 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

PC (Polycarbonate)

Transwell Permeable Supports are available in a broad range of pore sizes from 0.4 to 8.0 μm . 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.

Consult the product specification tables for more information.

2. Select a Pore Size

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

| Application | Cell Type | Pore Size (μm) |
|---|---|-----------------------------|
| 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/Air-Liquid Interface | Human skin model: Airway epithelial cells, disease model (e.g., COVID-19) | 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 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 Corning® Transwell® Inserts

| Insert Diameter (mm)* | Multiwell Plate or Dish Style | Insert Membrane Growth Area (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



24 mm and 6.5 mm Transwell inserts



12 mm Transwell inserts, PC (Cat. No. 3401)



75 mm Transwell insert, PC (Cat. No. 7910)



24 mm PET Transwell inserts

Individual Corning® 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 x 10 ⁶ | 1 x 10 ⁸ | 2 x 10 ⁶ | 2 x 10 ⁶ | 4 x 10 ⁵ | 1 x 10 ⁵ | 1 x 10 ⁵ |
| Opacity | Clear | Translucent | Clear | Translucent | Translucent | Translucent | Clear |
| 1-well | | ■ | | ■ | | | |
| 6-well | ■ | ■ | ■ | ■ | | ■ | |
| 12-well | ■ | ■ | ■ | ■ | | | |
| 24-well | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

Transwell Polycarbonate (PC) Membrane Inserts

- ▶ 10 µm thick translucent membrane
- ▶ Pore sizes ranging from 0.4 µm to 8.0 µm diameters
- ▶ TC-treated for optimal cell attachment
- ▶ Supplied in multiwell plates
- ▶ Membrane must be stained for cell visibility
- ▶ Sterile

| 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 |
| 7910 | 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 thick transparent membrane
- ▶ TC-treated for optimal cell attachment and growth
- ▶ Better cell visibility under phase contrast microscopy
- ▶ Supplied in multiwell plates
- ▶ Sterile

| 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 |
| 7424*** | Inserts in 100 mm rectangular tray | 0.4 | 5 | 20 |
| 7524*** | Rectangular reservoir with lid | N/A | 5 | 20 |

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

**Membrane surface suitable for cell culture.

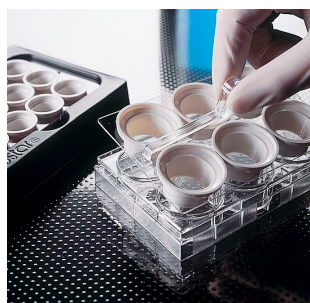
***2-Tier tray. Tray size (inches): 6.927 x 4.803 x 1.462



Snapwell Inserts, PC



Snapwell Inserts, PET



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 ⁶ | 1 x 10 ⁸ |
| 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)

Netwell™ Inserts

Netwell Inserts have 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- and 12-well Plates | ■ | ■ |

| Cat. No. | Description | Membrane | Membrane Pore Size (µm) | Qty/Pk | Qty/Cs |
|----------|---------------------------|----------|-------------------------|----------|--------|
| 3479 | Inserts in 6-well plates | PET | 74 | 6/plate | 48 |
| 3480 | Inserts in 6-well plates | PET | 440 | 6/plate | 48 |
| 3477 | Inserts in 12-well plates | PET | 74 | 12/plate | 48 |
| 3478 | Inserts in 12-well plates | PET | 440 | 12/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 |
| 3521 | Netwell 6-well carrier kit, for 24 mm inserts | 8 |
| 3520 | Netwell 12-well carrier kit for 15 mm inserts | 8 |

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).

Corning® Transwell® Support Systems

HTS Transwell-24 Permeable Supports



HTS Transwell-24 insert plates

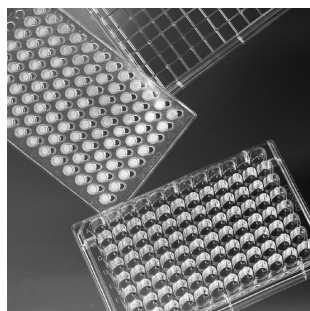
HTS insert plates are arrays of individual cell culture inserts connected by a rigid, robotics-friendly holder. This single-unit design makes insert plates ideal for running automated, high throughput drug transport (Caco-2 cells) cell toxicity studies or cell migration and invasion studies.

- ▶ 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 cm²/well.
- ▶ PET membrane (0.4 μm pore size) or PC membrane (0.4 and 3.0 μm pore sizes) are available.
- ▶ 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 ⁶ | 1 x 10 ⁸ | 1.6 x 10 ⁶ | 2 x 10 ⁶ | 4 x 10 ⁵ | 1 x 10 ⁵ |
| 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 |
| 3378 | HTS Transwell-24, bulk, PET | 0.4 | 12 | 12 |
| 3379 | HTS Transwell-24, individual, PET | 0.4 | 1 | 2 |
| 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 |
| 4395 | HTS Transwell-24, TC-treated reservoir with lid | – | 12 | 48 |



HTS Transwell-96 insert plates

HTS Corning® 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.
- ▶ PET membrane (0.4, 1.0 μm , and 8.0 μm pore sizes) or PC membrane (0.4, 3.0 μm , and 5.0 μm pore sizes) are available.
- ▶ The 0.143 cm^2 membrane area per well provides 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.
- ▶ The HTS Transwell-96 systems (0.4 μm PC and PET, 1.0 μm 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 μm PC, 8.0 μm PET) are packaged with the 96-well insert plate in the 96-well receiver plate with lid. Reservoir plates may be purchased separately.
- ▶ Sterile

| Cat. No. | Description | Membrane Pore Size (μm) | 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 TC-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 TC-treated | – | 10 | 10 |
| 3783 | HTS Transwell-96 white receiver plate and lid, standard TC-treated | – | 10 | 10 |
| 7494 | HTS Transwell-96 reservoir plate with media stabilizer and lid, Corning CellBIND® surface treated | – | 10 | 10 |

Culture Tubes

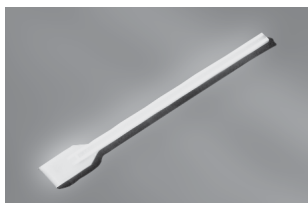


- ▶ Manufactured from optically clear polystyrene
- ▶ Threaded plug seal caps prevent leakage
- ▶ Tissue culture-treated tubes supplied racked
- ▶ Untreated tubes supplied bulk packed
- ▶ Sterile
- ▶ Nonpyrogenic

| 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

- ▶ 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. | 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** (Code 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. No. 431131) for single-handed manipulation.
- ▶ A foam rack is included 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 |
| 8671 | 2.0 | 1D and 2D bar coded, round bottom | Yes | 50 | 500 |
| 8676 | 2.0 | 1D bar coded, round bottom | Yes | 50 | 500 |
| 430662 | 4.0 | Round bottom | Yes | 50 | 500 |
| 430663 | 5.0 | Round bottom | Yes | 50 | 500 |
| 431337 | N/A | Vial cap, clear, non-sterile | N/A | 50 | 500 |

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. No. 431131) for single-handed manipulation.
- ▶ A foam rack is included with each case.
- ▶ RNase-/DNase-free
- ▶ Sterile
- ▶ Nonpyrogenic



Internal thread cryogenic vials

Internal Thread Color Cap Cryogenic Vials

| Cat. No. | Capacity (mL) | Cap Color | Style | Self-standing | Qty/Pk | Qty/Cs |
|----------|---------------|-----------|-----------------------|---------------|--------|--------|
| 431416 | 2.0 | Assorted | Round bottom | Yes | 50 | 500 |
| 431417 | 2.0 | Yellow | Round bottom | Yes | 50 | 500 |
| 431418 | 2.0 | Blue | Round bottom | Yes | 50 | 500 |
| 431419 | 2.0 | Green | Round bottom | Yes | 50 | 500 |
| 431420 | 2.0 | Red | Round bottom | Yes | 50 | 500 |
| 431421 | 2.0 | White | Round bottom | Yes | 50 | 500 |
| 431338 | N/A | Clear | Vial cap, non-sterile | N/A | 50 | 500 |

Tip: Cryogenic Vial Safety

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.

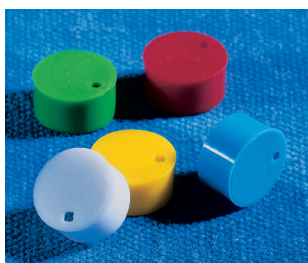
WARNING: Do not use cryogenic vials for storage in the liquid phase of liquid nitrogen. Only store vials in the vapor phase above the liquefied gas. Always use appropriate safety equipment when removing vials from cryogenic storage.



Internal thread color cap cryogenic vials



Bar coded cryogenic vials



Assorted colors of polypropylene cap inserts



Cryogenic vial racks

Internal Thread Orange Cap Cryogenic Vials

| Cat. No. | Capacity (mL) | Style | Self-standing | Qty/Pk | Qty/Cs |
|----------|---------------|-----------------------------------|---------------|--------|--------|
| 430487 | 1.2 | Conical bottom | Yes | 50 | 500 |
| 430488 | 2.0 | Round bottom | Yes | 50 | 500 |
| 430489 | 2.0 | Round bottom | No | 50 | 500 |
| 431386 | 2.0 | Round bottom | Yes | 50 | 250 |
| 8670 | 2.0 | 1D and 2D bar coded, round bottom | Yes | 50 | 500 |
| 8672 | 2.0 | 1D bar coded, round bottom | Yes | 50 | 500 |
| 430490 | 4.0 | Round bottom | No | 50 | 500 |
| 430491 | 4.0 | Round bottom | Yes | 50 | 500 |
| 430492 | 5.0 | Round bottom | No | 50 | 500 |
| 430656 | 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 liquefied gas. Always use appropriate safety equipment when removing vials from cryogenic storage.

Cap Inserts for Cryogenic Vials, Polypropylene

- ▶ Cap inserts provide color coding for easy sample identification.
- ▶ Cap inserts are packaged in resealable bags.
- ▶ Cap inserts fit all Corning® cryogenic vials.
- ▶ Nonsterile

| Cat. No. | Cap Color | Qty/Pk | Qty/Cs |
|----------|--|--------|--------|
| 430499 | Assorted (100 each of white, blue, red, green, and yellow) | 50 | 500 |
| 2015 | White | 50 | 500 |
| 2016 | Blue | 50 | 500 |
| 2017 | Red | 50 | 500 |
| 2018 | Green | 50 | 500 |
| 2019 | Yellow | 50 | 500 |

Cryogenic Vial Racks and Storage Boxes

- ▶ Reusable racks are designed for use with most cryogenic vials.
- ▶ Cat. No. 431131 has a locking feature for use with all Corning self-standing vials.

| Cat. No. | Description | Qty/Pk | Qty/Cs |
|----------|---|--------|--------|
| 431131 | Reusable orange polypropylene vial rack, holds 50 vials, self-locking design | 2 | 2 |
| 431119 | 81 count (9 x 9 array) cryogenic storage box, for 1 to 2 mL vials | 5 | 10 |
| 431120 | 81 count (9 x 9 array) cryogenic storage 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 |
| 8673 | Cryogenic storage box, polycarbonate, holds 81 vials, designed to fit Corning 2D bar coded cryogenic vials | 5 | 10 |
| 8674 | Cryogenic storage box, polycarbonate, holds 100 vials, designed to fit Corning 2D bar coded cryogenic vials | 5 | 10 |

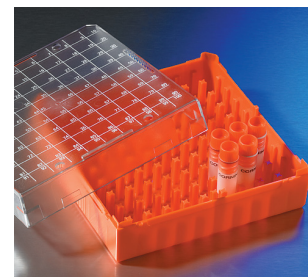
*431121 accepts internally threaded cryogenic vials only.



Cryogenic storage box (Cat. No. 431119)



Cryogenic storage box (Cat. No. 431120)



Cryogenic storage box (Cat. No. 431121)

Cell Culture Filtration



150 mL Tube Top Vacuum Filters

- ▶ 42 mm square membrane
- ▶ Minimizes unnecessary transfers by filtering directly into a 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, nonpyrogenic

| 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 Filtration Systems

- ▶ Four sizes: 150 mL, 250 mL, 500 mL, and 1L
- ▶ Filters feature printing on the funnel for easy product identification.
- ▶ Angled hose connector simplifies vacuum line attachment.
- ▶ Receiver bottles feature easy grip sides for improved handling.
- ▶ Individually packaged, sterile, nonpyrogenic
- ▶ Caps for receiver bottles are sterile and individually packaged.
- ▶ Extra plastic storage bottles are available.
- ▶ Prefilters not included



150 mL Capacity, 42 mm Square Membrane

| Cat. No. | Membrane | Funnel/Bottle Volume (mL) | Pore Size (µm) | Qty/Cs |
|----------|----------|---------------------------|----------------|--------|
| 431153 | PES | 150/150 | 0.22 | 12 |
| 431154 | CA | 150/150 | 0.22 | 12 |
| 431155 | CA | 150/150 | 0.45 | 12 |

250 mL Capacity, 49.5 mm Square Membrane

| | | | | |
|--------|-----|---------|------|----|
| 430756 | CN | 250/250 | 0.22 | 12 |
| 430767 | CA | 250/250 | 0.22 | 12 |
| 430768 | CA | 250/250 | 0.45 | 12 |
| 430771 | NY | 250/250 | 0.2 | 12 |
| 431096 | PES | 250/250 | 0.22 | 12 |

500 mL Capacity, 63 mm Square Membrane

| | | | | |
|--------|-----|---------|------|----|
| 430758 | CN | 500/500 | 0.22 | 12 |
| 430769 | CA | 500/500 | 0.22 | 12 |
| 430770 | CA | 500/500 | 0.45 | 12 |
| 430773 | NY | 500/500 | 0.2 | 12 |
| 431097 | PES | 500/500 | 0.22 | 12 |
| 431475 | PES | 500/500 | 0.1 | 12 |

1,000 mL Capacity, 79 mm Square Membrane

| | | | | |
|---------|-----|-------------|------|----|
| 430186 | CN | 1,000/1,000 | 0.22 | 12 |
| 430515 | NY | 1,000/1,000 | 0.2 | 12 |
| 430516 | CA | 1,000/1,000 | 0.45 | 12 |
| 430517 | CA | 1,000/1,000 | 0.22 | 12 |
| 431098 | PES | 1,000/1,000 | 0.22 | 12 |
| 431205* | CA | 500/1,000 | 0.22 | 12 |
| 431206* | CA | 500/1,000 | 0.45 | 12 |
| 431474 | PES | 1,000/1,000 | 0.1 | 12 |

*500 mL funnel with 63 mm membrane.

PES = polyethersulfone, CA = cellulose acetate, CN = cellulose nitrate, NY = nylon.



Bottle Top Vacuum Filters

- Individually packaged, sterile and nonpyrogenic
- 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 below).

150 mL Capacity, 42 mm Square Membrane

| Cat. No. | Membrane | Volume (mL) | Neck Size (mm) | Pore Size (µm) | Qty/Cs |
|----------|----------|-------------|----------------|----------------|--------|
| 430624 | CA | 150 | 33 | 0.22 | 48 |
| 430625 | CA | 150 | 33 | 0.45 | 48 |
| 430626 | CA | 150 | 45 | 0.22 | 48 |
| 430627 | CA | 150 | 45 | 0.45 | 48 |
| 431160 | PES | 150 | 33 | 0.22 | 48 |
| 431161 | PES | 150 | 45 | 0.22 | 48 |

500 mL Capacity, 63 mm Square Membrane

| | | | | | |
|--------|-----|-----|----|------|----|
| 430049 | NY | 500 | 45 | 0.2 | 12 |
| 430512 | CA | 500 | 33 | 0.45 | 12 |
| 430513 | CA | 500 | 45 | 0.22 | 12 |
| 430514 | CA | 500 | 45 | 0.45 | 12 |
| 430521 | CA | 500 | 33 | 0.22 | 12 |
| 431117 | PES | 500 | 33 | 0.22 | 12 |
| 431118 | PES | 500 | 45 | 0.22 | 12 |

1,000 mL Capacity, 79 mm Square Membrane

| | | | | | |
|--------|-----|-------|----|------|----|
| 430015 | CA | 1,000 | 45 | 0.22 | 12 |
| 431174 | PES | 1,000 | 45 | 0.22 | 12 |

PES = polyethersulfone, CA = cellulose acetate, CN = cellulose nitrate, NY = nylon.

Polystyrene 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.
- Bottles can be used with Corning vacuum filtration systems.
- Sterile
- Nonpyrogenic



Corning Easy Grip Style Storage Bottles

| 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 |

Corning Costar® Traditional Style Storage Bottles

| | | | | |
|------|-------|----|---|----|
| 8388 | 125 | 45 | 1 | 24 |
| 8390 | 250 | 45 | 1 | 12 |
| 8393 | 500 | 45 | 1 | 12 |
| 8396 | 1,000 | 45 | 1 | 12 |

Syringe Filters



- ▶ A variety of membranes are available to meet your needs: polyethersulfone (PES) – low protein binding and faster flow rates; surfactant-free cellulose acetate (SFCA) – lowest protein binding; polytetrafluorethylene (PTFE) – chemical resistance; regenerated cellulose (RC) – best choice for DMSO compatibility; nylon (NY) – hydrophilic, surfactant-free and lowest extractable
- ▶ 100% integrity tested, nonpyrogenic, noncytotoxic, and manufactured in accordance with ISO 9001 standards

| Cat. No. | Diameter (mm) | Pore Size (µm) | Membrane Material | Housing Material | Sterile | Inlet/Outlet | Packaging | Qty/Cs |
|----------|---------------|----------------|-------------------|------------------|---------|--------------|-----------|--------|
| 431215 | 15 | 0.2 | RC | PP | Yes | LL/LS | Ind | 50 |
| 431218 | 28 | 0.2 | SFCA-PF | AC | Yes | LL/LS | Ind | 50 |
| 431219 | 28 | 0.2 | SFCA | AC | Yes | LL/LS | Ind | 50 |
| 431220 | 28 | 0.45 | SFCA | AC | Yes | LL/LS | Ind | 50 |
| 431221 | 28 | 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 | 28 | 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 = polytetrafluorethylene, RC = regenerated cellulose, SFCA = surfactant-free cellulose acetate, SFCA-PF = surfactant-free cellulose acetate with prefilter.

*Recommended as in-line air filter.

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.

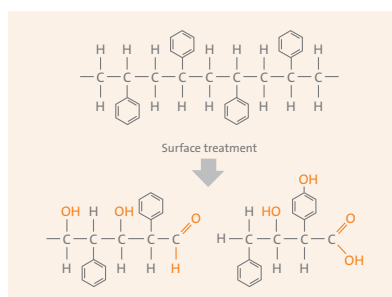


Figure 1. Polystyrene can be surface-modified by the addition of a variety of different chemical groups, by breaking the carbon chain backbone, or by opening the benzene ring (not shown).

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, multiwell 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 |
| Corning Synthemax II-SC substrate | Synthetic peptide surface coating | Mimics cells' natural environment with extracellular matrix-derived cell adhesion promoting peptide |

Corning® Ultra-Low Attachment (ULA)-coated Polystyrene Surface

The ULA 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 ULA surface on dishes, plates, flasks, and Corning CellSTACK® culture chamber 1-stack.

This ULA 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.

ULA 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 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

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 or electron beam 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 a ULA surface for use in situations where cell attachment must be kept to an absolute minimum.

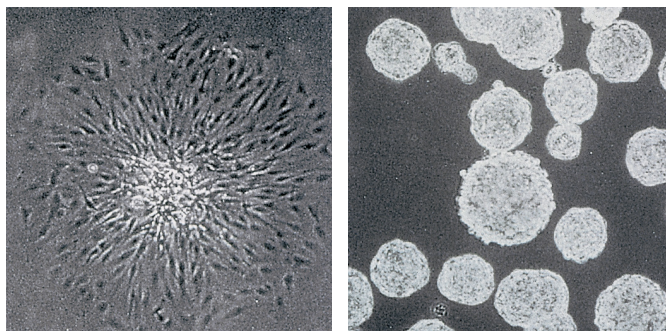


Figure 2. Single-cell-derived colonies of C6 glioma cells grow as flattened attached colonies in standard tissue culture-treated surface (left panel) but form unattached spherical colonies on the ULA surface (right panel).

Standard Tissue Culture (TC)-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, multiwell plates, CellSTACK culture chambers, roller bottles, and culture tubes.

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) |
|--|---|--|---|--|---|--|--|
| Physical Characteristics | | | | | | | |
| 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 | Biologically inert, hard, tough, excellent optical qualities |
| Clarity | Clear | Opaque | Translucent | Clear | Opaque | Opaque | Clear |
| Autoclave Results | Melts | May distort | Withstands several cycles | Withstands one cycle | OK | OK | Melts |
| Heat Distortion Point | 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 |
| Burning Rate | Slow | Slow | Slow | Self-extinguishing | Self-extinguishing | None | — |
| Effects of Laboratory Reagents | | | | | | | |
| Weak Acids | None | None | None | None | None | None | None |
| Strong Acids | Oxidizing acids attack | Oxidizing acids attack | Oxidizing acids attack | May be attacked | Attacked | None | Oxidizing acids attack |
| Weak Alkalies | None | None | None | None | None | None | None |
| Strong Alkalies | None | None | None | Slowly attacked | None | None | Attacked |
| 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 | Soluble in aromatic or chlorinated hydrocarbons |
| Gas Permeability of Thin Wall Products* | | | | | | | |
| O₂ | Low | High | High | Very low | Very low | — | Very low |
| N₂ | Very low | Low | Low | Very low | Very low | — | Very low |
| CO₂ | High | Very high | Very high | Low | — | — | Low |

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

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 area 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. Mycoplasma removal can be performed using a 0.1 μm pore filter. Routine laboratory sterilization of most media, buffers, biological fluids, and gases is usually done with 0.2 or 0.22 μm pore filter membranes. Clarification and prefiltration of solutions and solvents is best accomplished with 0.45 μm or larger filter membranes. Prefiltration to improve filter performance can also be accomplished by the use of glass fiber prefilters that can be purchased separately. Use Table 1 to match your applications with a recommended membrane and pore size.

Table 1. Selecting the Pore Size

| Application | Pore Size (μm) | Membrane Availability |
|------------------------------------|-----------------------------|---------------------------|
| Removing mycoplasma from solutions | 0.1 | Only PES |
| Sterilization of aqueous solutions | 0.2 to 0.22 | All membranes except PTFE |
| Ultracleaning of solvents (HPLC) | 0.2 to 0.22 | RC, Nylon, PTFE |
| Clarification of aqueous solutions | 0.45 | All membranes except PTFE |
| Clarification of solvents (HPLC) | 0.45 | RC, Nylon, PTFE |
| Course particle removal | 0.8 | SFCA |

PES = polyethersulfone, SFCA = surfactant-free cellulose acetate, PTFE = polytetrafluorethylene, RC = regenerated cellulose.

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

Corning Filter Membranes

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 information from Tables 2 and 3 will help you choose the best Corning® filter membranes for your applications.

Table 2. Characteristics of Corning Filter Membranes

| | Cellulose Nitrate | Cellulose Acetate | Nylon | Polyether-sulfone | Regenerated cellulose | PTFE |
|---------------------|-------------------|-------------------|---------------------------|-------------------|-----------------------|--------------|
| Wetting Agents | Yes | Yes | No, naturally hydrophilic | No | Yes | Does not wet |
| Protein Binding | Very high | Very low | Low to moderate | Very low | Low | N/A |
| DNA Binding | High | Very low | Very high | Very low | Low | N/A |
| Chemical Resistance | Low | Low | Moderate to high | Low | Very high | Very high |

PTFE = polytetrafluorethylene.

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 nontoxic 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.

Polyethersulfone (PES) membranes are highly recommended for filtering cell culture media. PES has both very low protein binding and extractables. PES also demonstrates faster flow rates than cellulosic or nylon membranes.

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

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

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

Corning Filter Housing Materials

The filter housing materials, as well as the filter membrane, 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 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 nonaggressive 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 a general guideline for the chemical resistance of Corning filter membranes and housings.

Table 3. Chemical Resistance Guide for Corning Filters*

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

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; PES = polyethersulfone; RC = regenerated cellulose; PS = polystyrene; PTFE = polytetrafluoroethylene; PP = polypropylene; PVC = polyvinylchlorides; AC = acrylic copolymer.

*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.

Step 3: Select the correct membrane area 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 size, 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.

Table 4. Typical Expected Throughput Volumes

| Filter Design and Dimensions | Effective Filter Area (cm ²) | Expected Throughput (mL)* |
|---------------------------------------|--|---------------------------|
| 15 mm diameter syringe/disc | 1.7 | 3 - 15 |
| 25 mm diameter syringe/disc | 4.8 | 10 - 50 |
| 26 mm diameter syringe/disc | 5.3 | 10 - 50 |
| 28 mm diameter syringe/disc | 6.2 | 10 - 50 |
| 50 mm diameter disc | 19.6 | 100 - 500 |
| 150 mL filter funnel (42 x 42 mm) | 13.6 | 100 - 500 |
| 250 mL filter funnel (49.5 x 49.5 mm) | 19.6 | 200 - 750 |
| 500 mL filter funnel (63 x 63 mm) | 33.2 | 300 - 1,500 |
| 1000 mL filter funnel (79 x 79 mm) | 54.5 | 500 - 3,000 |

*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 pre-filters with filter funnels may extend the throughput 50% to 100% above the values shown.

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

Corning offers three basic filter types: positive pressure-driven syringe and disc filters, Spin-X® centrifuge tube filters driven by centrifugation, and vacuum-driven filters. The vacuum-driven filters offer several different designs and styles in disposable plastic products.

Syringe/Disc Filters

The smaller conventional **Corning® syringe disc-type filters** (15, 25, 26, and 28 mm diameter) are used with syringes which serves as both the fluid reservoir and the pressure source. They are 100% integrity tested. The HPLC-certified nonsterile syringe filters are available with nylon, regenerated cellulose or polytetrafluorethylene (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 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.

Corning Disposable Plastic Vacuum Filters

These sterile filters are available in three styles: complete filter/storage systems, bottle top filters, and centrifuge tube top filters. Corning filters feature printed funnels that identify membrane type and product number for easy product identification. Angled hose connectors simplify vacuum line attachment. Four membranes are available to meet all of your filtration needs: cellulose acetate, cellulose nitrate, nylon, or polyethersulfone.

Corning filter/storage systems consist of a polystyrene filter funnel joined by an adapter ring to a removable polystyrene storage bottle with a separate sterile polyethylene cap. Receiver bottles feature easy grip sides for improved handling. Additional Corning polystyrene receiver/storage bottles can be ordered separately to increase throughput.

Corning bottle top filters have the same polystyrene filter funnel designs and capacities as the filter systems, but the adapter ring is designed for threading onto a glass bottle supplied by the user. Select either the 33 mm thread design for standard narrow glass mouth media bottles or the 45 mm design for PYREX® media bottles or PYREXPLUS® media bottles. See Safety Precautions for recommendations on using these products with glass bottles.

150 mL centrifuge tube top filters feature a 150 mL polystyrene filter funnel with a 50 mm diameter cellulose acetate membrane attached to a 50 mL polypropylene centrifuge tube to minimize unnecessary transfers by filtering directly into centrifuge tube.

Spin-X Centrifuge Tube Filters

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.



Corning syringe filters



Corning filter/storage systems



Corning Spin-X centrifuge tube filters

Improving Filter Performance

Getting the best performance from your filtration products requires two very important steps: selecting the right products for the job, and then using these products effectively. The first part of this filtration section covered the steps required to select the right filter for your applications; this section will help you optimize the filtration process by keying on the two most important areas – maximizing filter flow rate and throughput or capacity.

The flow rate and throughput of filters are dependent on many variables. Some variables, such as temperature, pressure, and especially, the characteristics of the sample, require special attention.

Effect of Pore Size

The pore size of filter membranes is usually dictated by the requirements of the filter application rather than the desired flow rate. Larger pore membranes usually have both faster flow rates and greater capacity before pore clogging slows the flow. Figure 2 indicates the effect of pore size on filter performance. As expected, the initial flow rate (steep part of the curve) of the .45 μm filter was approximately twice that of the .22 μm filter, although its capacity or throughput prior to clogging (the area at the plateau) was only about 20% greater.

Figure 2. Effect of Pore Size on Performance

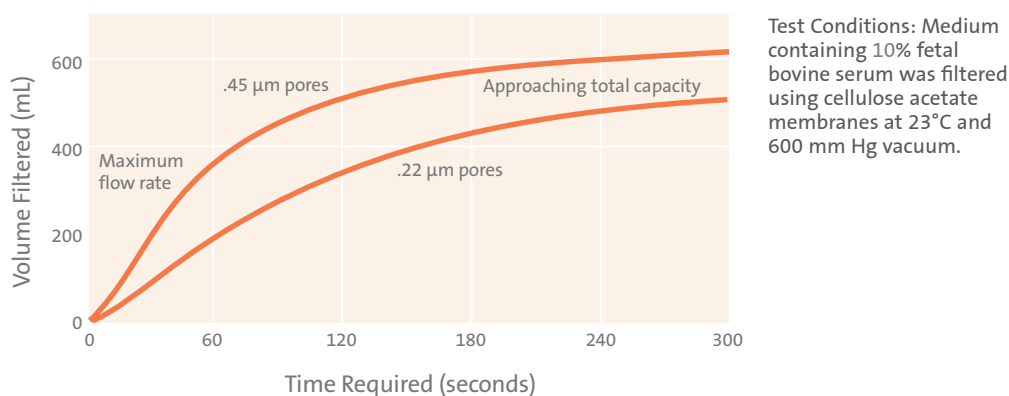


Table 5. Corning Filter Designs

| Design | Sterile | Filter Diameters/ Dimensions (mm) | Available Membrane Materials | Pore Sizes (μm) | Special Features |
|-------------------------------|---------|---|------------------------------------|---|--|
| Syringe Filters | Some | 15, 25, 26 and 28 | RC, PES, SFCA, NY and PTFE | 0.2, 0.45, and 0.8 | Ideal for small volume pressure filtration |
| Disc Filters | Yes | 50 | PTFE | 0.2 | Ideal for filtering solvents and gases |
| Vacuum Filter Systems* | Yes | 42, 49.5, 63, 79 | PES, CA, CN and Nylon | 0.2 (NY only), 0.22 (PES, CN), and 0.45 (CA only) | Easy grip bottles for storing filtrate |
| Bottle Top Vacuum Filters* | Yes | 42, 63, 79 | PES, CA, CN and Nylon | 0.2 (NY only), 0.22 (PES, CA, CN), and 0.45 (CA only) | Two neck widths to fit most glass bottles |
| Tube Top Vacuum Filters* | Yes | 42 | CA | 0.22 and 0.45 | Minimizes unnecessary transfers by filtering into a 50 mL centrifuge tube |
| Spin-X® Centrifuge Filters | Some | 7.7 | CA and Nylon | 0.22 and 0.45 | Ideal for purifying DNA from agarose gels |

CN = cellulose nitrate; CA = cellulose acetate; PES = polyethersulfone; RC = regenerated cellulose; PTFE = polytetrafluorethylene.

*Vacuum filter systems, bottle top vacuum filters, and tube top vacuum filters have a square membrane.

Effect of Membrane Area

The easiest and most practical way to increase filter flow rate is to increase the effective surface area of the filter membrane. Corning offers both syringe and vacuum filter units with a choice of membrane diameters that give a wide range of flow rates and throughputs (See Table 4).

Effect of Fluid Temperature

For most applications, filtering solutions at room temperature is fine. Usually increasing the temperature of a solution will increase the flow rate. For example, increasing the temperature of cell culture medium from 4°C to 37°C resulted in a doubling of the flow rate. This is most likely due to a decrease in the viscosity of the medium. In some cases, however, filtration at lower temperatures may increase the overall throughput, especially with protein and lipid-containing solutions such as serum.

Effect of Pressure Differential

For vacuum-driven filtration, a pressure differential (vacuum) of 400 mm Hg (7.73 psig) is recommended. Increasing the pressure differential further will slightly increase the flow rate, but it may also result in excess foaming as the gases in the filtrate come out of solution as bubbles. This is especially a problem with filtering bicarbonate-buffered cell culture media. The dissolved carbon dioxide in the medium will evolve quickly at higher-pressure differentials leading to a rise in pH and excessive foaming if serum proteins are present.

Effect of Prefiltration

A simple way to improve filter performance is to pretreat your solution. High speed centrifugation will remove most suspended particles and reduce filter clogging, extending both flow rate and throughput (Corning® 250 and 500 mL centrifuge bottles are ideal for centrifuging larger liquid volumes). Prefiltration through a glass fiber pad or depth filter will also reduce particle load and premature membrane clogging. The use of a glass fiber prefilter has been demonstrated to more than double the throughput when filtering calf serum. These glass fiber prefilters are available for all Corning vacuum filter systems and bottle top filters. For particularly difficult to filter solutions, it may be helpful to first prefilter the solution through a larger pore membrane filter.

Safety Precautions

Corning filter units are intended for use by persons knowledgeable in safe laboratory practices. Safety is one of the most critical concerns of any lab. Because of variations in conditions, Corning cannot guarantee any glassware or plasticware against breakage under vacuum or pressure. Failure can result from surface damage, improper pressure or temperature, or use with incompatible chemicals. Adequate precautions should always be taken to protect personnel doing such work. To help improve lab safety, Corning has compiled these common-sense suggestions concerning the safe use of filtration products:

- ▶ Use of vacuum-driven filters on glass or plastic bottles may cause personal injury if they implode during use. Eye protection is strongly recommended whenever glass or plastic vessels are used under partial vacuum negative pressure to guard against these injuries. Only bottles specifically designed for these applications should be used.
- ▶ Always use cylindrical bottles.
- ▶ Never use the 45 mm threaded bottle top filters on PYREX® or PYREXPLUS® media bottles larger than 2 liter capacity. Use of bottle top filters with PYREXPLUS media bottles (with plastic safety coatings) is highly recommended for vacuum filtration.
- ▶ Never use a square bottle for vacuum applications.
- ▶ Never use the 33 mm threaded bottle top filters on a glass media bottle that is larger than 500 mL.
- ▶ Never use plastic roller bottles as substitute receiver bottles during vacuum filtration.
- ▶ Do not use a bottle for vacuum applications if it is not designed to withstand a vacuum; if the bottle is scratched, chipped or cracked; if the bottle is clamped in such a way as to induce stress; or if the bottle is being hand held.
- ▶ Care must be taken when using syringe filters with small syringes (5 mL or less) as the pressures generated may exceed the 75 psi limit, causing a possible membrane or housing failure. Loss of valuable contents and personal injury may result. If clogging causes slower flow rates, we recommend that you replace filters rather than increase the pressure.

Catalog Number Index

| Cat. No. | Page No. | Cat. No. | Page No. | Cat. No. | Page No. | Cat. No. | Page No. | Cat. No. | Page No. |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 2015 | 23 | 3413 | 16 | 7524 | 16 | 430516 | 24 | 431118 | 25 |
| 2016 | 23 | 3414 | 16 | 7910 | 16 | 430517 | 24 | 431119 | 23 |
| 2017 | 23 | 3415 | 16 | 8388 | 25 | 430518 | 25 | 431120 | 23 |
| 2018 | 23 | 3420 | 16 | 8390 | 25 | 430521 | 25 | 431121 | 23 |
| 2019 | 23 | 3421 | 16 | 8393 | 25 | 430588 | 10 | 431131 | 23 |
| 3008 | 21 | 3422 | 16 | 8396 | 25 | 430589 | 10 | 431153 | 24 |
| 3010 | 21 | 3428 | 16 | 8670 | 23 | 430591 | 10 | 431154 | 24 |
| 3011 | 21 | 3450 | 16 | 8671 | 22 | 430597 | 10 | 431155 | 24 |
| 3260 | 10 | 3452 | 16 | 8672 | 23 | 430599 | 9 | 431160 | 25 |
| 3261 | 9 | 3460 | 16 | 8673 | 23 | 430624 | 25 | 431161 | 25 |
| 3262 | 9 | 3462 | 16 | 8674 | 23 | 430625 | 25 | 431174 | 25 |
| 3289 | 7 | 3464 | 16 | 8676 | 22 | 430626 | 25 | 431175 | 25 |
| 3290 | 7 | 3470 | 16 | 10020 | 8 | 430627 | 25 | 431205 | 24 |
| 3291 | 7 | 3471 | 11 | 10024 | 8 | 430639 | 7 | 431206 | 24 |
| 3292 | 8 | 3472 | 16 | 10030 | 8 | 430641U | 7 | 431215 | 26 |
| 3293 | 8 | 3473 | 11 | 10031 | 8 | 430656 | 23 | 431218 | 26 |
| 3294 | 9 | 3477 | 20 | 10034 | 8 | 430658 | 22 | 431219 | 26 |
| 3295 | 9 | 3478 | 20 | 10035 | 8 | 430659 | 22 | 431220 | 26 |
| 3335 | 11 | 3479 | 20 | 430015 | 25 | 430661 | 22 | 431221 | 26 |
| 3336 | 11 | 3480 | 20 | 430049 | 25 | 430662 | 22 | 431222 | 26 |
| 3337 | 11 | 3506 | 11 | 430157 | 21 | 430663 | 22 | 431224 | 26 |
| 3338 | 11 | 3512 | 11 | 430165 | 9 | 430720U | 7 | 431225 | 26 |
| 3374 | 19 | 3513 | 11 | 430166 | 9 | 430725U | 7 | 431227 | 26 |
| 3378 | 18 | 3516 | 11 | 430167 | 9 | 430756 | 24 | 431229 | 26 |
| 3379 | 18 | 3517 | 20 | 430168 | 7 | 430758 | 24 | 431231 | 26 |
| 3380 | 19 | 3519 | 20 | 430172 | 21 | 430767 | 24 | 431272 | 9 |
| 3381 | 19 | 3520 | 20 | 430186 | 24 | 430768 | 24 | 431301 | 9 |
| 3382 | 19 | 3521 | 20 | 430196 | 9 | 430769 | 24 | 431306 | 8 |
| 3383 | 19 | 3524 | 11 | 430281 | 25 | 430770 | 24 | 431328 | 8 |
| 3384 | 19 | 3526 | 11 | 430282 | 25 | 430771 | 24 | 431337 | 21 |
| 3385 | 19 | 3527 | 11 | 430293 | 9 | 430773 | 24 | 431338 | 21 |
| 3386 | 19 | 3535 | 5 | 430314 | 24 | 430823 | 7 | 431386 | 23 |
| 3387 | 19 | 3548 | 11 | 430320 | 24 | 430824 | 7 | 431416 | 22 |
| 3388 | 19 | 3583 | 19 | 430372 | 7 | 430825 | 7 | 431417 | 22 |
| 3391 | 19 | 3736 | 11 | 430487 | 23 | 431079 | 8 | 431418 | 22 |
| 3392 | 19 | 3737 | 11 | 430488 | 23 | 431080 | 8 | 431419 | 22 |
| 3395 | 18 | 3738 | 11 | 430489 | 23 | 431081 | 8 | 431420 | 22 |
| 3396 | 18 | 3783 | 19 | 430490 | 23 | 431082 | 8 | 431421 | 22 |
| 3397 | 18 | 3801 | 17 | 430491 | 23 | 431085 | 8 | 431463 | 7 |
| 3398 | 18 | 3814 | 7 | 430492 | 23 | 431096 | 24 | 431464U | 7 |
| 3399 | 18 | 4615 | 9 | 430499 | 23 | 431097 | 24 | 431465 | 7 |
| 3401 | 16 | 4616 | 7 | 430512 | 25 | 431098 | 24 | 431466 | 8 |
| 3402 | 16 | 7369 | 19 | 430513 | 25 | 431110 | 9 | 431474 | 24 |
| 3407 | 17 | 7424 | 16 | 430514 | 25 | 431111 | 9, 10 | 431475 | 24 |
| 3412 | 16 | 7494 | 19 | 430515 | 24 | 431117 | 25 | | |

Warranty/Disclaimer: Unless otherwise specified, all products are for research use or general laboratory use only.* Not intended for use in diagnostic or therapeutic procedures. Not for use in humans. These products are not intended to mitigate the presence of microorganisms on surfaces or in the environment, where such organisms can be deleterious to humans or the environment. Corning Life Sciences makes no claims regarding the performance of these products for clinical or diagnostic applications. *For a listing of US medical devices, regulatory classifications or specific information on claims, visit www.corning.com/resources.

Corning's products are not specifically designed and tested for diagnostic testing. Many Corning products, though not specific for diagnostic testing, can be used in the workflow and preparation of the test at the customers discretion. Customers may use these products to support their claims. We cannot make any claims or statements that our products are approved for diagnostic testing either directly or indirectly. The customer is responsible for any testing, validation, and/or regulatory submissions that may be required to support the safety and efficacy of their intended application.

CORNING

Corning Incorporated
Life Sciences
www.corning.com/lifesciences

NORTH AMERICA

t 800.492.1110
t 978.442.2200

ASIA/PACIFIC

Australia/New Zealand

t 61 427286832

Chinese Mainland

t 86 21 3338 4338

India

t 91 124 4604000

Japan

t 81 3-3586 1996

Korea

t 82 2-796-9500

Singapore

t 65 6572-9740

Taiwan

t 886 2-2716-0338

EUROPE

CSEurope@corning.com

France

t 0800 916 882

Germany

t 0800 101 1153

The Netherlands

t 020 655 79 28

United Kingdom

t 0800 376 8660

All Other European Countries

t +31 (0) 206 59 60 51

LATIN AMERICA

grupoLA@corning.com

Brazil

t 55 (11) 3089-7400

Mexico

t (52-81) 8158-8400