



Corning Liquid Handling Product Selection Guide

CORNING

Introduction

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

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

- ▶ New products information
- ▶ Technical information including:
 - Application notes
 - Instruction manuals
 - Product bulletins
- ▶ Product catalog information
- ▶ Product literature
- ▶ Complete distributor information

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

Ordering Information

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

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



Liquid Handling

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Overview

Designed For Performance

Corning Life Sciences offers a full line of liquid handling products that are manufactured under strict process controls guaranteeing consistent product performance. All Corning Life Sciences plastics manufacturing facilities are ISO 9001 registered.

In addition, customers can now request a Certificate of Quality for any Corning® or Costar® liquid handling product. Certificates are available 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.

Nonpyrogenic Certification

Most Corning and Costar liquid handling products are certified nonpyrogenic with a documented endotoxin level of equal to or less than 0.1 EU/mL. Endotoxins have been shown to cause variability in cell culture. Nonpyrogenic certification is 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.

Pipets



Stripette® Serological Pipets

- ▶ Manufactured and packaged with animal-free materials
- ▶ Sterile
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic
- ▶ Noncytotoxic
- ▶ Exclusive anti-drip tip assures accurate delivery.
- ▶ Color-coded magnifier stripes make volume reading and size selection easier.
- ▶ Bidirectional graduations provide choice of ascending and descending scales.
- ▶ Negative graduations allow additional working volume.
- ▶ Three packaging options:
 - Individually wrapped, paper/plastic
 - Individually wrapped, clear plastic
 - Bulk packed
- ▶ Volumetric accuracy of $\pm 2\%$ at stated capacity



Paper/plastic wrap



Clear plastic wrap



Bulk pack

Individually Wrapped, Paper/Plastic Wrap

| Cat. No. | Capacity (mL) | Graduations (mL) | Negative Grads. (mL) | Color-coded Stripe | Qty/Pk | Qty/Cs |
|----------|---------------|------------------|----------------------|--------------------|--------|--------|
| 4485 | 1 | 1/100 | 0.2 | Yellow | 50 | 1,000 |
| 4486 | 2 | 1/100 | 0.2 | Green | 50 | 1,000 |
| 4487 | 5 | 1/10 | 2.5 | Blue | 50 | 200 |
| 4488 | 10 | 1/10 | 3.0 | Orange | 50 | 200 |
| 4489 | 25 | 2/10 | 10.0 | Red | 25 | 200 |
| 4490 | 50 | 1/2 | 10.0 | Purple | 25 | 100 |
| 4491 | 100 | 1 | n/a | Aqua | 10 | 100 |

Individually Wrapped, Clear Plastic Wrap

| | | | | | | |
|-------|-----|-------|------|--------|-----|-------|
| 4011 | 1 | 1/100 | 0.2 | Yellow | 100 | 1,000 |
| 4012 | 1 | 1/100 | 0.2 | Yellow | 100 | 200 |
| 4021 | 2 | 1/100 | 0.2 | Green | 100 | 1,000 |
| 4051 | 5 | 1/10 | 2.5 | Blue | 50 | 200 |
| 4101 | 10 | 1/10 | 3.0 | Orange | 50 | 200 |
| 4492* | 10 | 1/10 | 3.0 | Orange | 50 | 200 |
| 4251 | 25 | 2/10 | 10.0 | Red | 50 | 200 |
| 4501 | 50 | 1/2 | 10.0 | Purple | 25 | 100 |
| 4484 | 100 | 1 | n/a | Aqua | 10 | 100 |

Bulk Packed in Bags

| | | | | | | |
|------|----|-------|------|--------|----|-------|
| 4010 | 1 | 1/100 | 0.2 | Yellow | 50 | 1,000 |
| 4020 | 2 | 1/100 | 0.2 | Green | 50 | 1,000 |
| 4050 | 5 | 1/10 | 2.5 | Blue | 50 | 500 |
| 4100 | 10 | 1/10 | 3.0 | Orange | 50 | 500 |
| 4250 | 25 | 2/10 | 10.0 | Red | 25 | 200 |
| 4500 | 50 | 1/2 | 10.0 | Purple | 25 | 100 |

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

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



Clean room packaging

Clean Room Packaging for Stripette® Serological Pipets

Corning’s clean room packaged pipets are a safety and convenience revolution. This extraordinary packaging is ideal for cell-based vaccine and drug production facilities, or other laboratory clean rooms.

- ▶ Triple-bagged
- ▶ Each pipet is individually wrapped in easy open paper/plastic
- ▶ No need for decontamination spraying with alcohol
- ▶ Sterility Assurance Level (SAL) of 10⁻⁶

Note: Clean room packaged Stripettes have the same features as the standard Stripettes except for the sterility and packaging.



1
Contained in a twist-tied liner (Bag 1), the entire case contents of triple-bagged pipets can easily be removed from the corrugated box for clean area storage.

2
At the first stage clean room, the liner (Bag 1) is opened and the double-bagged inner packs with their outer sterile barriers (Bag 2) are removed.

3
At the second stage clean room the outer sterile barrier (Bag 2) is opened and the inner sterile barrier (Bag 3) is removed.

4
Reaching the point of use, the inner sterile barrier (Bag 3) is opened and the individually wrapped pipets are removed.

Clean Room Packaging, Individually Wrapped, Paper/Plastic, Triple-bagged

| Cat. No. | Capacity (mL) | Graduations (mL) | Negative Grads. (mL) | Color-coded Stripe | Qty/Pk | Qty/Cs |
|----------|---------------|------------------|----------------------|--------------------|--------|--------|
| 7041 | 1 | 1/100 | 0.2 | Yellow | 50 | 1,000 |
| 7042 | 2 | 1/100 | 0.2 | Green | 50 | 1,000 |
| 7045 | 5 | 1/10 | 2.5 | Blue | 50 | 200 |
| 7015 | 10 | 1/10 | 3.0 | Orange | 50 | 200 |
| 7016 | 25 | 2/10 | 10.0 | Red | 25 | 200 |
| 7017 | 50 | 1/2 | 10.0 | Purple | 25 | 100 |
| 7000 | 100 | 1 | n/a | Aqua | 10 | 100 |

Shorty Stripette Serological Pipets

Shorty Stripette pipets are 32% shorter than standard-sized pipets enabling more freedom of movement when used under the hood or in other confined spaces. Their shorter size helps to reduce hand, wrist, and arm fatigue sometimes associated with repetitive pipetting. Since they are shorter than standard pipets, they use less plastic and packaging and are more environmentally friendly than standard-sized pipets.

- ▶ One-piece design reduces the possibility of particulates
- ▶ Printed stripe magnifies the meniscus making volume reading easier
- ▶ Individually wrapped in paper/plastic wrap
- ▶ Sterile
- ▶ Nonpyrogenic
- ▶ Noncytotoxic

| Cat. No. | Capacity (mL) | Graduations (mL) | Negative Grads (mL) | Color Strip | Qty/Pk | Qty/Cs |
|----------|---------------|------------------|---------------------|-------------|--------|--------|
| 4102 | 5 mL | 1/10 | 3.0 | Black | 200 | 200 |
| 4103 | 10 mL | 2/10 | 8.0 | Black | 100 | 100 |





Aspirating Pipets

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

| Cat. No. | Volume (mL) | Packaging | Qty/Pk | Qty/Cs |
|----------|-------------|--|--------|--------|
| 4975 | 1 | Individually wrapped, bulk packed | 50 | 1,000 |
| 9186 | 2 | Individually wrapped, clear plastic wrap | 100 | 1,000 |
| 9016 | 2 | Individually wrapped, paper/plastic wrap | 50 | 500 |
| 9099 | 5 | Individually wrapped, clear plastic wrap | 50 | 200 |

For Corning® Stripettor™ and Lambda® pipettors, see the **Equipment Product Selection Guide** (CLS-EQ-090).

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

Pipet Tips



Remove deck from reload system.



Insert deck into hinged rack.

Corning® DeckWorks™ Reload Systems

Corning DeckWorks reload systems are available in 10 µL, 200 µL, 300 µL, and 1,000 µL sizes and allow for convenient and economical reloading of durable Corning DeckWorks hinged racks. DeckWorks reload decks are packaged in transparent trays for easy tip identification, requires no transfer devices, saves space, and minimizes packaging waste. Although the pipet tips are made from virgin medical-grade resins, the reload decks and rack bases are manufactured from 100% recycled polypropylene. Nonsterile decks and racks are steam autoclavable.

Corning DeckWorks low binding tips are available in 10 µL, 200 µL, and 300 µL sizes. Proprietary low binding technology reduces surface tension on the interior wall of the tip. Leaching and/or subsequent sample degradation associated with silicone-based tips is eliminated. DeckWorks low binding tips are ideal for quantitative assays in which sample binding can significantly alter results. Specific applications include accurate and precise pipetting of expensive reagents, DNA, proteins, and/or peptides.

Standard Tips

| Cat. No. | Volume Range (µL) | Color | Sterile | Decks/Pk | Tips/Pk | Pks/Cs |
|----------|-------------------|---------|---------|----------|---------|--------|
| 4125 | 0.1 - 10 | Natural | No | 10 | 960 | 4 |
| 4126 | 1 - 200 | Natural | No | 10 | 960 | 4 |
| 4127 | 1 - 200 | Yellow | No | 10 | 960 | 4 |
| 4128 | 1 - 300 | Natural | No | 10 | 960 | 4 |
| 4129 | 100 - 1,000* | Natural | No | 8 | 768 | 4 |

*Maximum working volume is 1250 µL.

Low Binding Tips

| | | | | | | |
|------|----------|---------|----|----|-----|---|
| 4153 | 0.1 - 10 | Natural | No | 10 | 960 | 4 |
| 4154 | 1 - 200 | Natural | No | 10 | 960 | 4 |
| 4155 | 1 - 300 | Natural | No | 10 | 960 | 4 |

Corning DeckWorks Reload System Starter Kits

DeckWorks starter kits contain one DeckWorks reload system with standard tips and empty hinged racks.

- ▶ 10 empty racks accompany 10 µL, 200 µL, and 300 µL volume tips
- ▶ 8 empty racks accompany 1000 µL volume tips

| Cat. No. | Volume Range (µL) | Color | Sterile | Decks/Pk | Tips/Pk | Pks/Cs |
|----------|-------------------|---------|---------|----------|---------|--------|
| 4130 | 0.1 - 10 | Natural | No | 10 | 960 | 1 |
| 4131 | 1 - 200 | Natural | No | 10 | 960 | 1 |
| 4132 | 1 - 200 | Yellow | No | 10 | 960 | 1 |
| 4133 | 1 - 300 | Natural | No | 10 | 960 | 1 |
| 4134 | 100 - 1,000 | Natural | No | 8 | 768 | 1 |

Corning® DeckWorks™ Hinged Rack Pipet Tips



Standard Tips

Corning universal fit tips in hinged DeckWorks racks are available in 10 µL, 200 µL, 300 µL, and 1,000 µL sizes. The 10 µL, 300 µL, and 1,000 µL tips are extended length and allow for improved access into microcentrifuge (1.5 mL) and standard conical bottom (15/50 mL) centrifuge tubes. Robust 96-tip racks are designed for repeated steam autoclave cycles and can be reused by removing the empty grey tip deck and replacing it with a new reload deck of 96 tips from the DeckWorks reload system. Corning racked 300 µL DeckWorks pipet tips are designed for all popular 300 µL multi-channel instruments.

| Cat. No. | Volume Range (µL) | Color | Sterile | Racks/Pk | Tips/Pk | Packs/Cs |
|----------|-------------------|---------|---------|----------|---------|----------|
| 4120 | 0.1 - 10 | Natural | Yes | 10 | 960 | 4 |
| 4115 | 0.1 - 10 | Natural | No | 10 | 960 | 4 |
| 4121 | 1 - 200 | Natural | Yes | 10 | 960 | 4 |
| 4116 | 1 - 200 | Natural | No | 10 | 960 | 4 |
| 4122 | 1 - 200 | Yellow | Yes | 10 | 960 | 4 |
| 4117 | 1 - 200 | Yellow | No | 10 | 960 | 4 |
| 4123 | 1 - 300 | Natural | Yes | 10 | 960 | 4 |
| 4118 | 1 - 300 | Natural | No | 10 | 960 | 4 |
| 4124 | 100 - 1,000 | Natural | Yes | 8 | 768 | 4 |
| 4119 | 100 - 1,000 | Natural | No | 8 | 768 | 4 |

Low Binding Tips

Corning DeckWorks low binding tips are available in 10 µL, 200 µL, and 300 µL sizes. Proprietary low binding technology reduces surface tension on the interior wall of the tip. Leaching and/or subsequent sample degradation associated with silicone-based tips are eliminated. DeckWorks low binding tips are ideal for quantitative assays in which sample binding can significantly alter results. Specific applications include accurate and precise pipetting of expensive reagents, DNA, proteins and/or peptides.

| Cat. No. | Volume Range (µL) | Color | Sterile | Racks/Pk | Tips/Pk | Packs/Cs |
|----------|-------------------|---------|---------|----------|---------|----------|
| 4150 | 0.1 - 10 | Natural | Yes | 10 | 960 | 4 |
| 4147 | 0.1 - 10 | Natural | No | 10 | 960 | 4 |
| 4151 | 1 - 200 | Natural | Yes | 10 | 960 | 4 |
| 4148 | 1 - 200 | Natural | No | 10 | 960 | 4 |
| 4152 | 1 - 300 | Natural | Yes | 10 | 960 | 4 |
| 4149 | 1 - 300 | Natural | No | 10 | 960 | 4 |

Low Binding Barrier Tips

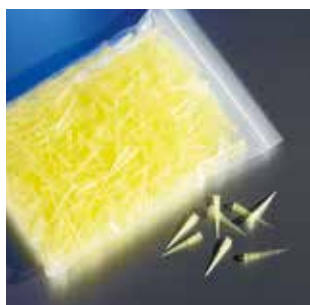
Corning DeckWorks low binding barrier tips feature an inert, high-density polyethylene barrier to eliminate aerosol carryover contamination during critical pipetting procedures. DeckWorks low binding barrier tips will not trap liquids or inhibit PCR in the event of over pipetting.

| Cat. No. | Volume Range (µL) | Color | Sterile | racks/Pk | Tips/Pk | Packs/Cs |
|----------|-------------------|---------|---------|----------|---------|----------|
| 4135 | 0.1 - 10 | Natural | Yes | 10 | 960 | 4 |
| 4136 | 1 - 20 | Natural | Yes | 10 | 960 | 4 |
| 4137 | 1 - 100 | Natural | Yes | 10 | 960 | 4 |
| 4138 | 1 - 200 | Natural | Yes | 10 | 960 | 4 |
| 4139* | 1 - 200 | Natural | Yes | 8 | 768 | 4 |
| 4140 | 100 - 1,000 | Natural | Yes | 8 | 768 | 4 |

*The unique design of this extended-length tip allows standardization across a wide range of 20 µL, 50 µL, 100 µL, and 200 µL pipettors.



Corning DeckWorks tip station takes less space than other brands



Corning® DeckWorks Tip Station

Corning DeckWorks tip station maximizes bench space while minimizing plastic waste. Tip stations contain 960 tips, are available in extended-length 10 μL and traditional 200 μL sizes, and are the ideal single and multi-channel pipetting stations. The 5-layer deck design (2 x 96) matches the microtiter plate format. This stable pipetting platform fits easily into sterile hood environments. Lids can be snap-positioned to expose a single side (96 tips) only. Applications include pre- and post-PCR procedures, cell culture, and assays requiring large tip quantities. Corning DeckWorks tip stations are offered both sterile and nonsterile.

| Cat. No. | Volume Range (μL) | Color | Sterile | Tips/Pk | Packs/Cs |
|----------|--------------------------------|---------|---------|---------|----------|
| 4141 | 0.1 - 10 | Natural | No | 960 | 5 |
| 4143 | 0.1 - 10 | Natural | Yes | 960 | 5 |
| 4142 | 1 - 200 | Natural | No | 960 | 5 |
| 4144 | 1 - 200 | Natural | Yes | 960 | 5 |

Bulk Tips

Corning DeckWorks bulk pipet tips are compatible with DeckWorks racks and packaged in resealable polyethylene bags. Tip sizes include 10 μL , 200 μL , and 1000 μL and offer maximum savings.

| Cat. No. | Volume Range (μL) | Color | Sterile | Tips/Pk | Packs/Cs |
|----------|--------------------------------|---------|---------|---------|----------|
| 4110 | 0.1 - 10 | Natural | No | 1000 | 10,000 |
| 4111 | 1 - 200 | Natural | No | 1000 | 10,000 |
| 4112 | 1 - 200 | Yellow | No | 1000 | 10,000 |
| 4114 | 100 - 1,000 | Natural | No | 768 | 7,680 |

Corning® DeckWorks™ Pipet Tips and Pipettor Compatibility Guide

| Volume | CORNING | | | | | | | | | | GILSON® | | | | | SARTORIUS BIOHIT | | | | | |
|----------------------|----------------------------------|---|----------------------------------|---------------------------------|-----------------------------------|--|----------------------------------|-------------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|---|----------------------------------|--------------------------------|---|---|--|------------------------------|--|---------------------------------|
| | Lambda® Plus 2 µL Single-Channel | Lambda Plus 10 µL Single- and Multi-channel | Lambda Plus 20 µL Single-channel | Lambda Plus 50 µL Multi-channel | Lambda Plus 100 µL Single-channel | Lambda Plus 200 µL Single- and Multi-channel | Lambda Plus 300 µL Multi-channel | Lambda Plus 1,000 µL Single-channel | Pipetman® 2 µL Single-channel | Pipetman 10 µL Single-channel | Pipetman 20 µL Single-channel | Pipetman 100 µL Single-channel | Pipetman 200 µL Single- and Multi-channel | Pipetman 1,000 µL Single-channel | Proline® 2.5 µL Single-channel | Proline 10 µL Single- and Multi-channel | Proline 50 µL Single- and Multi-channel | Proline 100 µL Single- and Multi-channel | Proline 250 µL Multi-channel | Proline 300 µL Single- and Multi-channel | Proline 1,000 µL Single-channel |
| STANDARD TIPS | | | | | | | | | | | | | | | | | | | | | |
| 0.1 - 10 µL | ■ | ■ | | | | | | | ■ | ■ | | | | | ■ | ■ | | | | | |
| 1 - 200 µL | | | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | | | | ■ | ■ | | | |
| 1 - 300 µL | | | ■ | ■ | ■ | ■ | ■ | | | | ■ | ■ | ■ | | | | ■ | ■ | ■ | ■ | |
| 100 - 1,000 µL | | | | | | | | ■ | | | | | | ■ | | | | | | | ■ |
| BARRIER TIPS | | | | | | | | | | | | | | | | | | | | | |
| 0.1 - 10 µL | ■ | ■ | | | | | | | ■ | ■ | | | | | ■ | ■ | | | | | |
| 1 - 20 µL | | | ■ | | | | | | | | ■ | | | | | | | | | | |
| 1 - 100 µL | | | | | ■ | | | | | | | ■ | | | | | | ■ | ■ | | |
| 1 - 200 µL | | | | | | ■ | | | | | | | ■ | | | | | | | | |
| 1 - 200 µL* | | | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | | | | | ■ | ■ | ■ | |
| 100 - 1,000 µL | | | | | | | | ■ | | | | | | ■ | | | | | | | ■ |

*Extended length

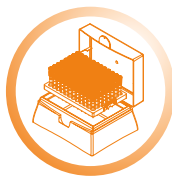
The DeckWorks Pipet Tip System Solution Includes:



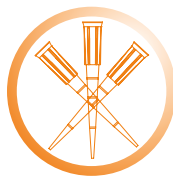
RELOADS



BARRIER TIPS



RACKED TIPS



BULK TIPS



TIP STATION

EPENDORF

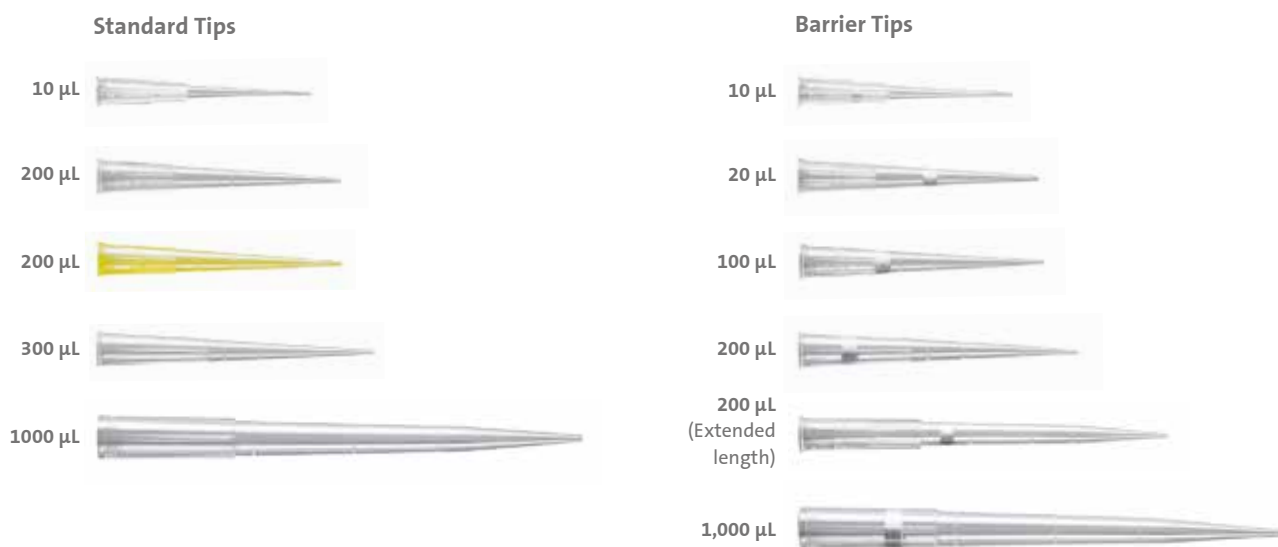
THERMOLABSYSTEMS

OXFORD/NICHIRYO

| Research®/Reference 2.5 µL Single-channel | Research/Reference 10 µL Single- and Multi-channel | Research/Reference 20 µL Single-channel | Research/Reference 100 µL Single- and Multi-channel | Research/Reference 200 µL Single-channel | Research/Reference 300 µL Single- and Multi-channel | Research/Reference 1,000 µL Single-channel | Finnpipette™ 2 µL Single-channel | Finnpipette 10 µL (micro) Single- and Multi-channel | Finnpipette 10 µL (Universal) Single-channel | Finnpipette 20 µL Single-channel | Finnpipette 50 µL Single- and Multi-channel | Finnpipette 100 µL Single-channel | Finnpipette 200 µL Single-channel | Finnpipette 300 µL Single- and Multi-channel | Finnpipette 1,000 µL Single-channel | Benchmark® 2 µL Single-channel | Benchmark 10 µL Single-channel | Benchmark 20 µL Single-channel | Benchmark 50 µL Single- and Multi-channel | Benchmark 100 µL Single-channel | Benchmark 200 µL Single- and Multi-channel | Benchmark 1,000 µL Single-channel | |
|---|--|---|---|--|---|--|----------------------------------|---|--|----------------------------------|---|-----------------------------------|-----------------------------------|--|-------------------------------------|--------------------------------|--------------------------------|--------------------------------|---|---------------------------------|--|-----------------------------------|---|
| | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| | | | ■ | ■ | ■ | | | | | | | | | | | | | ■ | ■ | | | | |
| | | | | ■ | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | ■ |
| | | | | | ■ | ■ | | | | | | | | | | | ■ | | | | | | ■ |
| | ■ | | | | | | | ■ | ■ | | | | | | | | | ■ | ■ | | | | |
| | | ■ | | | | | | | | | | | | | | | | | | ■ | | | |
| | | | ■ | ■ | ■ | | | | | | | | | | | | | | | | ■ | ■ | ■ |
| | | | | | ■ | ■ | | | | | | | | | | | | | | | | | ■ |

Corning® DeckWorks™ Pipet Tips Size Guide

Corning DeckWorks extended-length pipet tips minimize contamination issues often associated with traditional pipet tip styles.





Racked pipet tips



Stack rack pipet tips



Bulk pack pipet tips



Universal fit hinged rack pipet tips

Corning® Universal Fit 200 μ L and 1000 μ L Pipet Tips

- ▶ Corning universal fit tips are designed to provide a reliable fit with most major brand pipettors. (A Pipet Tip Compatibility Guide can be requested or downloaded from the Corning website).
- ▶ Beveled orifice helps ensure accurate fluid delivery.
- ▶ 1-200 μ L universal fit tips are graduated at the 250 μ L, 500 μ L, and 1,000 μ L volumes.
- ▶ Select from three packaging options:
 - Stack rack tips feature a stack of five racks, each containing 96 tips, for a total of 480 tips in a space-saving design.
 - Bulk packed tips are nonsterile and economical.
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic

Racked Tips

| Cat. No. | Volume Range (μ L) | Format | Color | Sterile | Racks/Cs | Tips/Cs |
|----------|-------------------------|---------------|---------|---------|----------|---------|
| 4863 | 1 - 200 | 96 tips/rack | Natural | No | 10 | 960 |
| 4864 | 1 - 200 | 96 tips/rack | Natural | Yes | 10 | 960 |
| 4865 | 1 - 200 | 96 tips/rack | Yellow | No | 10 | 960 |
| 4860 | 1 - 200 | 96 tips/rack | Yellow | Yes | 10 | 960 |
| 4867 | 100 - 1,000 | 100 tips/rack | Blue | No | 10 | 1,000 |
| 9032 | 100 - 1,000 | 100 tips/rack | Blue | Yes | 10 | 1,000 |

Stack Rack Pipet Tips

| | | | | | | |
|------|---------|---------------------|---------|-----|----|-------|
| 4803 | 1 - 200 | 480 tips/stack rack | Natural | No | 10 | 4,800 |
| 4804 | 1 - 200 | 480 tips/stack rack | Natural | Yes | 10 | 4,800 |
| 4806 | 1 - 200 | 480 tips/stack rack | Natural | No | 2 | 960 |

Universal Fit Hinged Rack Pipet Tips

| | | | | | | |
|------|-------------|--------------------------------|--------|-----|------------|-------|
| 4711 | 1 - 200 | 96 tip hinged rack | Yellow | Yes | 10 | 960 |
| 4712 | 1 - 200 | 96 Tip hinged rack | Yellow | No | 10 | 960 |
| 4710 | 1 - 200 | 96 tip insert for hinged rack | Yellow | No | 10 Inserts | 960 |
| 4714 | 100 - 1,000 | 100 tip hinged rack | Blue | Yes | 10 | 1,000 |
| 4713 | 100 - 1,000 | 100 tip hinged rack | Blue | No | 10 | 1,000 |
| 4715 | 100 - 1,000 | 100 tip insert for hinged rack | Blue | No | 10 Inserts | 1,000 |

Bulk Packed Pipet Tips

| | | | | | | |
|------|-------------|-----------|---------|----|-------|--------|
| 4844 | 1 - 200 | Bulk pack | Natural | No | 1,000 | 10,000 |
| 4862 | 1 - 200 | Bulk pack | Natural | No | 1,000 | 1,000 |
| 4845 | 1 - 200 | Bulk pack | Yellow | No | 1,000 | 10,000 |
| 4866 | 1 - 200 | Bulk pack | Yellow | No | 1,000 | 1,000 |
| 4846 | 100 - 1,000 | Bulk pack | Blue | No | 1,000 | 10,000 |
| 4868 | 100 - 1,000 | Bulk pack | Blue | No | 1,000 | 1,000 |



IsoTip Filtered Pipet Tips

- ▶ IsoTip filtered pipet tips feature an inert, hydrophobic barrier that prevents aerosolized contaminants from coming in contact with pipettor shafts. (A Pipet Tip Compatibility Guide can be requested or downloaded from the Corning website.)
- ▶ Ideal for applications where avoiding cross contamination is critical, such as DNA amplification and radioisotope handling
- ▶ Packaged sterile
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic

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

*Extended-length tip designed for use with 2 μL to 20 μL, 10 μL to 100 μL, and 20 μL to 200 μL pipettors.

1 μL to 200 μL Gel-loading Pipet Tips

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

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

Microvolume Gel-loading Pipet Tips

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

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

For reagent reservoirs, liquid transfer systems, and aspirators, see **Equipment** section of this catalog.

For Axygen® pipet tips, see the **Axygen Product Selection Guide** (CLS-A-PSG-001).



Microvolume Pipet Tips

- ▶ Microvolume tips provide accurate, reliable performance in the 0.1 µL to 10 µL range for major brand ultra-micropipettors
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic

| Cat. No. | Volume Range (µL) | Fit | Sterile | Qty/Pk | Tips/Cs |
|----------|-------------------|--|---------|-----------|---------|
| 4826 | 0.1 - 10 | Gilson and other popular ultra-micropipettors | No | 96/rack | 960 |
| 4894 | 0.1 - 10 | Gilson and other popular ultra-micropipettors | Yes | 96/rack | 960 |
| 4840 | 0.1 - 10 | Gilson and other popular ultra-micropipettors | No | 1,000/bag | 10,000 |
| 4830 | 0.5 - 10 | Eppendorf and other popular ultra-micropipettors | Yes | 96/rack | 960 |
| 4834 | 0.5 - 10 | Eppendorf and other popular ultra-micropipettors | No | 96/rack | 960 |
| 4901 | 0.5 - 10 | Eppendorf and other popular ultra-micropipettors | No | 1,000/bag | 10,000 |

Vacuum Filtration

150 mL Tube Top Vacuum Filters

- ▶ 42 mm square membrane
- ▶ Minimizes unnecessary transfers by filtering directly into 50 mL centrifuge tube
- ▶ Includes two centrifuge tube stands with each case
- ▶ Each polypropylene centrifuge tube is supplied with an individually wrapped cap for storage.
- ▶ Individually packaged
- ▶ Sterile
- ▶ 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 with 45 mm neck size
- ▶ Low liquid retention funnel design
- ▶ 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.
- ▶ Extra plastic storage bottles are available.
- ▶ Prefilters must be ordered separately.
- ▶ Individually packaged
- ▶ Sterile
- ▶ Nonpyrogenic
- ▶ Caps for receiver bottles are sterile and individually packaged.

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 |

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



Vacuum Filtration Systems (Continued)**500 mL Capacity, 63 mm Square Membrane**

| Cat. No. | Membrane | Funnel/Bottle Volume (mL) | Pore Size (µm) | Qty/Cs |
|----------|----------|---------------------------|----------------|--------|
| 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 |
| 431474 | PES | 1,000/1,000 | 0.1 | 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 |

*500 mL funnel with 63 mm membrane.

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

For technical information, please refer to pages G24-G35.

Bottle Top Vacuum Filters

- ▶ Three sizes: 150 mL, 500 mL and 1,000 mL
- ▶ Low liquid retention funnel design
- ▶ 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® glass 1395 bottles, to be used on 2L and smaller sizes only.
- ▶ Prefilters must be ordered separately.
- ▶ Individually packaged
- ▶ Sterile
- ▶ Nonpyrogenic

**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.

Corning® Glass Fiber Prefilters

For use with vacuum filtration systems or bottle top vacuum filters

| Cat. No. | Shape | Filter Funnel (mL) | Qty/Cs |
|----------|----------------|--------------------|--------|
| 431410 | 42 mm square | 150 | 100 |
| 431411 | 49.5 mm square | 250 | 100 |
| 431412 | 63 mm square | 500 | 100 |
| 431413 | 79 mm square | 1000 | 100 |

For technical information, please refer to pages G24-G35.

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 and noncytotoxic, manufactured in accordance with ISO 9002 standards

| Cat. No. | Diameter (mm) | Pore Size (µm) | Membrane Material | Housing Material | Sterile | Inlet/Outlet | Packaging | Qty/Cs |
|----------|---------------|----------------|-------------------|------------------|---------|--------------|------------|--------|
| 431212 | 4 | 0.2 | RC | PP | Yes | LL/LS | Individual | 50 |
| 431215 | 15 | 0.2 | RC | PP | Yes | LL/LS | Individual | 50 |
| 431218 | 28 | 0.2 | SFCA-PF | AC | Yes | LL/LS | Individual | 50 |
| 431219 | 28 | 0.2 | SFCA | AC | Yes | LL/LS | Individual | 50 |
| 431220 | 28 | 0.45 | SFCA | AC | Yes | LL/LS | Individual | 50 |
| 431221 | 28 | 0.8 | SFCA | AC | Yes | LL/LS | Individual | 50 |
| 431222 | 25 | 0.2 | RC | PP | Yes | LL/LS | Individual | 50 |
| 431224 | 25 | 0.2 | NY | PP | Yes | LL/LS | Individual | 50 |
| 431225 | 25 | 0.45 | NY | PP | Yes | LL/LS | Individual | 50 |
| 431227* | 50 | 0.2 | PTFE | PP | Yes | HB/HB | Individual | 12 |
| 431229 | 28 | 0.2 | PES | AC | Yes | LL/LS | Individual | 50 |
| 431231 | 25 | 0.45 | PTFE | PP | No | LL/LS | Bulk | 50 |

*Recommended as in-line air filter.

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.

Spin-X® Centrifuge Tube Filters



- ▶ Spin-X centrifuge tube filters consist of a membrane-containing filter unit within a microcentrifuge tube.

▶ Uses:

- Removing bacteria, cells, and particles from liquids
- HPLC sample preparation
- DNA removal from agarose or acrylamide gels. Maximum RCF is 16,000 x g.

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

CA = cellulose acetate, NY = Nylon.

For technical information, please refer to pages G24-G35.

Spin-X® UF Concentrators

Spin-X UF centrifugal concentrators offer a simple, one step procedure for concentrating or desalting proteins and other biomolecules with 90% or better recovery.

- ▶ The vertical membrane design and thin channel filtration chamber minimizes membrane fouling and provides fast, high speed concentrating, even with particle laden solutions.
- ▶ Low binding polyethersulfone (PES) membranes are available with five molecular weight cut-offs (MWCO): 5,000, 10,000, 30,000, 50,000, and 100,000 to meet all of your concentrating needs. Choose an MWCO half to a third smaller than the protein to be concentrated.
- ▶ The MWCO and graduations are printed on the side of the concentrator tube to avoid mix-ups
- ▶ Spin-X UF 6 and 20 concentrators can be used with either swinging bucket or fixed angle rotors. Spin-X UF 500 concentrators require fixed angle rotors.

Spin-X UF 500

| | | | | |
|--------|---------------|--------|--------------|----|
| 431477 | Spin-X UF 500 | 500 µL | 5,000 MWCO | 25 |
| 431478 | Spin-X UF 500 | 500 µL | 10,000 MWCO | 25 |
| 431479 | Spin-X UF 500 | 500 µL | 30,000 MWCO | 25 |
| 431480 | Spin-X UF 500 | 500 µL | 50,000 MWCO | 25 |
| 431481 | Spin-X UF 500 | 500 µL | 100,000 MWCO | 25 |

Spin-X UF 6

| Cat. No. | Description | Capacity | Membrane | Qty/Pk |
|----------|-------------|----------|--------------|--------|
| 431482 | Spin-X UF 6 | 6 mL | 5,000 MWCO | 25 |
| 431483 | Spin-X UF 6 | 6 mL | 10,000 MWCO | 25 |
| 431484 | Spin-X UF 6 | 6 mL | 30,000 MWCO | 25 |
| 431485 | Spin-X UF 6 | 6 mL | 50,000 MWCO | 25 |
| 431486 | Spin-X UF 6 | 6 mL | 100,000 MWCO | 25 |

Spin-X UF 20

| | | | | |
|--------|--------------|-------|--------------|----|
| 431487 | Spin-X UF 20 | 20 mL | 5,000 MWCO | 12 |
| 431488 | Spin-X UF 20 | 20 mL | 10,000 MWCO | 12 |
| 431489 | Spin-X UF 20 | 20 mL | 30,000 MWCO | 12 |
| 431490 | Spin-X UF 20 | 20 mL | 50,000 MWCO | 12 |
| 431491 | Spin-X UF 20 | 20 mL | 100,000 MWCO | 12 |

A Size to Fit All Your Concentrating Needs



Spin-X UF 500



Spin-X UF 6



Spin-X UF 20

For technical information, please refer to page G28.

Bottles



Corning low profile easy grip style storage bottles



Costar traditional style storage bottles



Polystyrene Storage Bottles

- ▶ Disposable polystyrene bottles for storage of media, buffers, and other aqueous solutions
- ▶ Corning® low profile style with easy grip sides that facilitate handling
- ▶ Costar® traditional style with smooth sides
- ▶ Plug seal caps (45 mm) provide an airtight seal and help minimize the risk of contamination.
- ▶ Bottles can be used with Corning® vacuum filtration systems with 45 mm neck sizes, see pages G12-G13.
- ▶ Sterile
- ▶ Nonpyrogenic

Corning Low Profile 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 |

Costar Traditional Style Storage Bottles

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

Corning Square PET Storage Bottles

- ▶ Good for storage of media, buffers and other aqueous solutions
- ▶ Available in four sizes: 125 mL, 250 mL, 500 mL, and 1L
- ▶ Large 37 mm opening provides easier access for liquid transfer
- ▶ Screened white enamel graduations are easier to read than molded graduations
- ▶ Large white marking spot for easier identification
- ▶ Individually packaged bottles have Sterility Assurance Level (SAL) of 10⁻⁶.
- ▶ Bottles are validated USP Class VI, noncytotoxic, and nonpyrogenic

| Cat. No. | Capacity (mL) | Thread Finish | Neck I.D. Size (mm) | Approx. Diam. x Height (mm) | Grad. Range (mL) | Grad. Interval (mL) | Qty/Pk | Qty/Cs |
|----------|---------------|---------------|---------------------|-----------------------------|------------------|---------------------|--------|--------|
| 431530 | 125 | GL 45 | 37 | 52.5 x 106.5 | 50 - 125 | 25 | 12 | 24 |
| 431531 | 250 | GL 45 | 37 | 59 x 142.5 | 50 - 250 | 25 | 12 | 24 |
| 431532 | 500 | GL 45 | 37 | 77 x 176 | 100 - 500 | 50 | 12 | 24 |
| 431533 | 1000 | GL 45 | 37 | 92 x 216.5 | 100 - 1000 | 50 | 12 | 24 |

Corning® Square Polycarbonate Storage Bottles



- ▶ Strong, easier to handle, require less space (13% to 20%) on the shelf or in the autoclave
- ▶ Ideal for mixing, sampling, and storage
- ▶ Strong polycarbonate bottles are more break-resistant than other glass or plastic bottles.
- ▶ Use a linerless, 45mm one-piece autoclavable orange GL 45 threaded polypropylene plug seal cap.
- ▶ Screened white enamel graduations are easier to see than molded graduations.
- ▶ Sterile
- ▶ Bottles can be autoclaved once at 121°C and 15 psi. Repeated autoclaving weakens polycarbonate and is not recommended.
- ▶ Store up to -80°C.



Corning offers reusable GL 45 septa caps for these storage bottles with a choice of silicone septa or PTFE-faced silicone septa.

| Cat. No. | Capacity (mL) | Shape | Bottle Material | Neck Diam. (mm) | Qty/Bag | Qty/Cs |
|----------|---------------|--------|-----------------|-----------------|---------|--------|
| 431430 | 150 | Square | Polycarbonate | 45 | 1 | 24 |
| 431431 | 250 | Square | Polycarbonate | 45 | 1 | 24 |
| 431432 | 500 | Square | Polycarbonate | 45 | 1 | 24 |
| 431433 | 1000 | Square | Polycarbonate | 45 | 1 | 24 |

Optional Caps and Accessories

| Cat No. | Description | Thread Finish | Qty/Cs |
|-------------|------------------------------------|---------------|--------|
| 1395-45HTSC | Cap, open top PBT high temperature | GL 45 | 10 |
| 1395-45SS | Septa, Silicone | N/A | 10 |
| 1395-45TS | Septa, PTFE-faced silicone | N/A | 10 |

Note: Most GL 45 threaded caps designed for glass storage bottles use a different sealing design and will not give a secure seal if used on these plastic bottles.

Caution: These square PET bottles should NOT be used with bottle top filter units, or in other applications involving vacuum pressure, as breakage may occur.

Corning Octagonal PET Bottles



- ▶ Available in six sizes: 30 mL, 60 mL, 125 mL, 250 mL, 500 mL, and 1L
- ▶ Packaged in convenient, shrink-wrapped trays within an outer bag to assure cleanliness
- ▶ Break-resistant bottles are an ergonomic and easy to handle alternative to glass.
- ▶ Leak-proof, tamper-evident HDPE screw cap
- ▶ Molded graduations for accurate measurements
- ▶ USP class VI compliant bottles are validated noncytotoxic and nonhemolytic.
- ▶ Bottles have Sterility Assurance Level (SAL) of 10⁻⁶.
- ▶ Nonpyrogenic

| Cat. No. | Capacity (mL) | Bottle Material | Screw Cap Color | Neck I.D. (mm) | Screw Cap (mm) | Qty/Tray | Qty/Cs |
|----------|---------------|-----------------|-----------------|----------------|----------------|----------|--------|
| 431729 | 30 | PET* | Natural | 17.5 | 21.0 | 24 | 120 |
| 431730 | 60 | PET | Natural | 17.5 | 21.0 | 24 | 96 |
| 431731 | 125 | PET | Natural | 31.7 | 34.7 | 24 | 48 |
| 431732 | 250 | PET | Natural | 31.7 | 34.7 | 24 | 48 |
| 431733 | 500 | PET | Natural | 31.7 | 34.7 | 12 | 24 |
| 431734 | 1000 | PET | Natural | 31.7 | 34.7 | 12 | 24 |

*Polyethylene terephthalate.

For a complete list of Corning storage bottles, visit www.corning.com/lifesciences.

Containers



Corning® Flexible Polypropylene Sample Container

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

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

Corning Coliform Water Test Disposable Sample Container, Sterile with Sodium Thiosulfate Tablet

Sterile container used in testing for the presence of coliform, a microbiological contaminant in drinking water. Manufactured from pure polypropylene in a sterile environment. The one-piece container has attached lid to reduce chance of contamination. Locking arrow assures sterility has not been compromised. The EPA fill line of 100 mL \pm 2.5% makes it easy to use. A sodium thiosulfate tablet has been added to each container thus saving lab prep time and expense. Leak-tight when sealed properly. An added benefit is the tie-down to protect from accidental opening and also serves as a custody seal. Sample label and instructions for use are supplied with each container. A low cost, convenient product which meets EPA requirements.

| Cat. No. | Description | Capacity (mL) | Approx. Diam. x Height (mm) | Qty/Cs |
|----------|-----------------------|---------------|-----------------------------|--------|
| 1700-100 | Container with tablet | 100-120 | 65 x 120 | 100 |



Corning Water Test Disposable Sample Container, Sterile without Sodium Thiosulfate Tablet

Sterile container used in the testing of non-chlorinated drinking water. Manufactured from pure, recyclable polypropylene. The one-piece container has attached lid to reduce chance of contamination. Locking arrow assures sterility has not been compromised. Leak-tight when sealed properly. An added benefit is the tie-down which protects against accidental opening.

| Cat. No. | Description | Capacity (mL) | Approx. Diam. x Height (mm) | Qty/Cs |
|----------|--------------------------|---------------|-----------------------------|--------|
| 1705-100 | Container without tablet | 100-120 | 65 x 120 | 100 |



Corning Snap-seal Disposable Plastic Sample Containers

Designed for a wide variety of applications, these containers provide a reliable leak-tight seal when closed properly. The Snap-Seal locking device keeps the cap closed and secure. The specially designed hinged cap stays in place in use, reducing the chance of sample contamination. The containers are made of recyclable polypropylene, in a translucent style for normal usage. The containers are graduated in both milliliters and ounces, and the cap has a rough surface for marking.

| Cat. No. | Capacity | Color | Approx. Diam. x Height (mm) | Qty/Cs |
|----------|------------------|---------|-----------------------------|--------|
| 1730-5X | 0.45 oz. (13 mL) | Natural | 16 x 94 | 500 |
| 1730-2C | 1.5 oz. (45mL) | Natural | 30 x 84 | 400 |
| 1730-4H | 4 oz. (120 mL) | Natural | 45 x 91 | 200 |
| 1730-4L | 4 oz. (120 mL) | Natural | 68 x 52 | 200 |
| 1730-8 | 8 oz. (240 mL) | Natural | 80 x 75 | 100 |
| 1730-10 | 10 oz. (300 mL) | Natural | 63 x 112 | 100 |



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

Cylinder



Corning® Graduated Cylinder

The 100 mL Corning optically clear polystyrene graduated cylinder is designed for aseptic and accurate dispensing of sterile culture media or other biological fluids. A polyethylene dust cover is included.

- ▶ Optically clear polystyrene
- ▶ Graduated for accurate dispensing
- ▶ Polyethylene dust cover included
- ▶ Sterile

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

Spatulas



Spatulas

Disposable Anti-static Spatulas

- ▶ Corning spatulas are designed to save time and to provide contamination-free samples.
- ▶ Eliminates the recycling and resterilizing necessary with reusable spatulas
- ▶ Available in five different configurations
- ▶ Microspatulas available in two configurations
- ▶ Individually packaged
- ▶ Antistatic
- ▶ Sterile
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic



Microspatulas

| Cat. No. | Description | Qty/Cs |
|----------|---------------------------------|--------|
| 3003 | Spatula, tapered blade/spoon | 100 |
| 3004 | Spatula, small spoon/spoon | 100 |
| 3005 | Spatula, round end/spoon | 100 |
| 3006 | Spatula, V-scoop/spoon | 100 |
| 3007 | Spatula, flat end/spoon | 100 |
| 3012 | Microspatula, tapered end/scoop | 50 |
| 3013 | Microspatula, rounded end/scoop | 50 |

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

Centrifuge Tubes



15 mL Centrifuge Tubes

- ▶ Corning® 15 mL centrifuge tubes feature black printed graduations and a large white marking spot
- ▶ Available with your choice of cap styles: the advanced Corning CentriStar™ cap or the original plug seal cap
- ▶ Sterile
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic
- ▶ 95 kPa (14 psi) pressure tested – plug seal cap only

| Cat. No. | Material | Cap Style | Max. RCF | Qty/Pk | Qty/Cs |
|----------|----------------------------------|-------------------------------|----------|------------|--------|
| 430053 | PET | Plug seal | 3,600 | 50/sleeve | 500 |
| 430055 | PET | Plug seal | 3,600 | 50/rack | 500 |
| 430052 | PP | Plug seal | 12,000 | 50/rack | 500 |
| 430766 | PP | Plug seal | 12,000 | 50/sleeve | 500 |
| 430790 | PP | CentriStar | 12,500 | 50/rack | 500 |
| 430791 | PP | CentriStar | 12,500 | 50/sleeve | 500 |
| 431470 | PP | No cap (tube only) | 12,000 | 25/sleeve | 500 |
| 431471 | PP | CentriStar cap only (no tube) | 12,000 | 100/sleeve | 500 |
| 431355 | Foam centrifuge tube rack, 15 mL | | – | – | 20 |

PP = polypropylene, PET = polyethylene terephthalate, RCF = relative centrifugal force (x g).



50 mL Centrifuge Tubes

- ▶ Corning 50 mL centrifuge tubes feature black printed graduations and a large white marking spot
- ▶ Available with your choice of cap styles: the advanced CentriStar cap or the original plug seal cap
- ▶ 95 kPa (14 psi) pressure tested – plug seal cap only
- ▶ Simplify your workflow with:
 - Color bands visually identify samples
 - Hazardous materials pictograms that comply with OSHA and GHS standards

- ▶ Sterile
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic

| Cat. No. | Material | Cap Style | Max. RCF | Feature | Qty/Pk | Qty/Cs |
|----------|----------|------------|----------|--|--------------------|--------|
| 430304 | PET | Plug seal | 3,600 | Conical bottom | 25/rack | 500 |
| 430290 | PP | Plug seal | 15,500 | Conical bottom | 25/rack | 500 |
| 430291 | PP | Plug seal | 15,500 | Conical bottom | 25/sleeve | 500 |
| 430828 | PP | CentriStar | 17,000 | Conical bottom | 25/rack | 500 |
| 430829 | PP | CentriStar | 17,000 | Conical bottom | 25/sleeve | 500 |
| 4558 | PP | CentriStar | 17,000 | Conical bottom | 25/Universal rack* | 300 |
| 431526 | PP | Plug seal | 15,500 | Easy ID color strip – green, conical bottom | 25/Universal rack | 300 |
| 431527 | PP | Plug seal | 15,500 | Easy ID color strip – orange, conical bottom | 25/Universal rack | 300 |
| 431528 | PP | Plug seal | 15,500 | Easy ID color strip – blue, conical bottom | 25/Universal rack | 300 |
| 431525 | PP | Plug seal | 15,500 | Hazardous materials label, conical bottom | 25/Universal rack | 300 |
| 430897 | PP | Plug seal | 3,000 | Self-standing bottom | 25/sleeve | 500 |
| 430921 | PP | CentriStar | 3,000 | Self-standing bottom | 25/sleeve | 500 |

PET = polyethylene terephthalate, PP = polypropylene, RCF = relative centrifugal force (x g).



Easy ID color strip tubes



50 mL centrifuge tube with hazardous materials label



Self-standing 50 mL Centrifuge Tubes

- ▶ Corning® 50 mL centrifuge tubes feature black printed graduations and a large white marking spot.
- ▶ Available with your choice of cap styles: the advanced Corning CentriStar™ cap or the original plug seal cap
- ▶ 95 kPa (14 psi) pressure tested – plug seal cap only
- ▶ Tubes are bulk packed in resealable sleeves.
- ▶ Sterile
- ▶ RNase-/DNase-free
- ▶ Nonpyrogenic

| Cat. No. | Material | Cap Style | Max. RCF | Qty/sleeve | Qty/Cs |
|----------|----------|------------|----------|------------|--------|
| 430897 | PP | Plug seal | 3,000 | 25 | 500 |
| 430921 | PP | Centristar | 3,000 | 25 | 500 |

PP = polypropylene, RCF = relative centrifugal force (x g).

For dimensions of Corning 15 mL and 50 mL centrifuge tubes, contact Corning Scientific Support at ScientificSupport@corning.com.

250 mL and 500 mL Centrifuge Tubes and Support Cushions

- ▶ Corning 250 mL and 500 mL polypropylene tubes are ideal for applications requiring large volume centrifugation
- ▶ Support cushions must be used with this product unless the rotor has appropriately shaped V-bottom holders
- ▶ Tubes are sterile
- ▶ Nonpyrogenic



| Cat. No. | Description | Material | Cap Style | Max RCF | Qty/Pk | Qty/Cs |
|----------|------------------------|----------|-----------|---------|--------|--------|
| 430776 | 250 mL tube | PP | Plug seal | 6,000 | 6 | 102 |
| 430236 | 250 mL support cushion | PEI | N/A | N/A | N/A | 6 |
| 431123 | 500 mL tube | PP | Plug seal | 6,000 | 6 | 36 |
| 431124 | 500 mL support cushion | PEI | N/A | N/A | N/A | 6 |

PP = polypropylene, PEI = polyetherimide, RCF = relative centrifugal force (x g).

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

Microcentrifuge Tubes

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



Costar® Snap Cap Polypropylene Microcentrifuge Tubes

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

Snap Cap Microcentrifuge Tubes

| Cat. No. | Volume (mL) | Color | Qty/Pk | Qty/Cs |
|----------|-------------|----------|--------|--------|
| 3208 | 0.65 | Natural | 500 | 1,000 |
| 3209* | 0.65 | Rainbow* | 200 | 1,000 |
| 3620 | 1.7 | Natural | 500 | 500 |
| 3621 | 1.7 | Natural | 500 | 5,000 |
| 3622* | 1.7 | Rainbow* | 100 | 500 |
| 3213** | 2.0 | Natural | 500 | 1,000 |

Low Binding Snap Cap Microcentrifuge Tubes

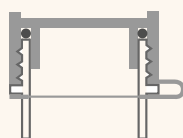
| | | | | |
|------|------|---------|-----|-----|
| 3206 | 0.65 | Natural | 500 | 500 |
| 3207 | 1.7 | Natural | 250 | 250 |

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

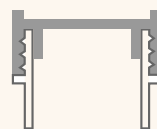
**2.0 mL Dolphin style tube.

Corning® Screw Cap Polypropylene Microcentrifuge Tubes

- Corning polypropylene microcentrifuge tubes feature screw caps that provide a tight secure seal.
- Choice of attached cap with silicone O-ring or unattached rim seal cap
- Withstands a maximum 20,000 RCF
- Sterile



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



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

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



Corning® 96-well Cluster Tubes

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

| Cat. No. | Format | Sterile | Rack | Qty/Pk | Qty/Cs |
|----------|--------------|---------|------|---------|--------|
| 4401 | Individual | No | No | 960/bag | 960 |
| 4410 | Individual | No | Yes | 96/rack | 960 |
| 4411 | Individual | Yes | Yes | 96/rack | 960 |
| 4408 | 8-tube strip | No | No | 120/bag | 120 |
| 4412 | 8-tube strip | No | Yes | 12/rack | 120 |
| 4413 | 8-tube strip | Yes | Yes | 12/rack | 120 |
| 4418 | 8-cap strip | Yes | No | 12/bag | 120 |

Technical Appendix

Selecting the Best Corning® Syringe or Vacuum Filter for Your Application

Choosing a filter doesn't 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 Corning membrane and housing material for your application.
- ▶ **Step 3:** Select the correct membrane diameter to optimize flow rate and throughput.
- ▶ **Step 4:** Choose the best Corning filter design for your application.

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

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

- ▶ Routine laboratory sterilization of most media, buffers, biological fluids, and gases is usually done with 0.2 or 0.22 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 sold separately.
- ▶ Use Table 1 to match your applications with a recommended membrane and pore size.

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

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

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

Therefore, it is very important to understand their characteristics and the potential effects filter membranes can have on the solutions they contact. The information from Tables 2 and 3 will help you choose the best Corning membranes for your applications:

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 = polytetrafluoroethylene, RC = regenerated cellulose.



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

Cellulose acetate (CA) membranes have a very low binding affinity for most protein binding, such as filtering culture media containing sera. However, both cellulose acetate and cellulose nitrate membranes are naturally hydrophobic and contain 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.

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.

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.

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

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 pre-wetted 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) is used in some of the Corning syringe filter housings. This plastic should only be used in filtering non-aggressive aqueous solutions and biological fluids. Refer to Table 3 for more chemical compatibility information.

Polypropylene (PP) is used in 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.

PYREX® and PYREXPLUS® glass is very resistant to virtually all laboratory solvents. However, it can be attacked by hydrofluoric or hot phosphoric acid etched by hot alkali. The coating of PYREXPLUS labware is designed to resist leakage resulting

Table 2. Characteristics of Corning Filter Membranes

| Membrane Material | Polyethersulfone | Cellulose Acetate | Nylon | Cellulose Nitrate | Regenerated Cellulose | Polytetrafluorethylene (PTFE) |
|--------------------------------------|------------------|-------------------|---------------------------|-------------------|-----------------------|-------------------------------|
| Flow rates for Medium with 10% Serum | Best | Very good | Poor | Good | Not applicable | Not applicable |
| Wetting Agents | No | Yes | No, naturally hydrophilic | Yes | Yes | Does not wet |
| Protein Binding | Very low | Very Low | Low to moderate | Very high | Low | Not applicable |
| DNA Binding | Very low | Very low | Very high | High | Low | Not applicable |
| Chemical Resistance | Low | Low | Moderate to high | Low | Very high | Very high |

Table 3. Chemical Resistance of Filter Membranes and Housing Materials

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

| Chemical Class | Membrane Material | | | | | | Housing Material | | | |
|------------------|-------------------|----|----|-----|----|------|------------------|----|----|-----|
| | 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 | 2 | 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 | 3 | 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, PES = polyethersulfone, RC = regenerated cellulose, PTFE = polytetrafluorethylene, PS = polystyrene, PP = polypropylene, AC = acrylic copolymer, PYR = PYREX glass.



Filtration systems with bottles



Bottle top filters



Centrifuge tube top filters

from a brief chemical exposure that might occur if the vessel is broken. Prolonged and/or repeated chemical exposure of the coating to aldehydes, ketones, chlorinated solvents, and concentrated acids should be avoided.

Chemical Compatibility of Corning Filters

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.

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 design, effective filtration surface area, and expected throughput volumes. The lower values are typical of viscous or particle-laden solutions; the higher values are typical of buffers or serum-free medium.

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

Corning offers three basic filter types: positive pressure-driven syringe and disc filters and vacuum-driven filters. The vacuum-driven filters offer several different designs and styles in both reusable and disposable plastic products.

Disposable Plastic Vacuum Filters

These sterile filters are available in three styles: complete filter/storage systems, bottle top filters, and centrifuge tube top filters. Angled hose connector simplifies vacuum line attachment.

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. Filters are available with cellulose acetate, cellulose nitrate, nylon, or polyethersulfone membranes.

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 or plastic 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 glass Storage Bottles with GL 45 threads. See Safety Precautions section (below) for recommendations on using these products with glass bottles. Filters are available with cellulose acetate, nylon, or polyethersulfone membranes.

150 mL centrifuge tube top filters feature a 150 mL polystyrene filter funnel with an 18 cm² cellulose acetate membrane attached to a 50 mL polypropylene centrifuge tube to minimize unnecessary transfers by filtering directly into centrifuge tube. Filters are available with cellulose acetate membranes.

Disposable Syringe/Disc Filters

The smaller **Corning syringe filters** (4, 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.

Table 4. Typical Expected Throughput Volumes

| Filter Design and Dimensions | Effective Filter Area (cm ²) | Expected Throughput (mL)* |
|---------------------------------------|--|---------------------------|
| 4 mm diameter syringe/disc | 0.07 | 0.05 - 3 |
| 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.

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.

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. Due to 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 suggestions concerning the safe use of filtration products:

- ▶ Use appropriate personal protective equipment for the application.
- ▶ 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 a 45 mm threaded bottle top filter on a PYREX® or PYREXPLUS® media bottle larger than 2 liter capacity.
- ▶ Never use a square bottle for vacuum applications.
- ▶ Never use a 33 mm threaded bottle top filter on a glass media bottle that is larger than 500 mL.



4, 15, and 25 to 28 mm syringe filters



50 mm syringe filters

- ▶ Never use plastic roller bottles as substitute receiver bottles for 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.

References

1. Brock, T.S. Membrane Filtration: A User's Guide and Reference Manual. Science Tech, Inc. Madison, WI, 381 pp. (1983).
2. Lukaszewicz, R.C. and Fisher, R. Mechanisms of Membrane Filtration for Particulate and Microbial Retention in Critical Applications. Pharmaceutical Technology, Vol. 5 (June 1981).
3. Walsh, R.L. and Coles, M.E. Binding of IgG and Other Proteins to Microfilters. Clinical Chemistry 26(3):496-498 (1981).

Table 5. Corning Filter Designs

| Design | Sterile | Filter Diameters (mm) | Available Membrane Materials | Pore Sizes (µm) | Special Features |
|---|---------|-----------------------|------------------------------------|----------------------------|---|
| Syringe Filters | Some | 4, 15, 25, 26, 28 | RC, PES, SFCA, NY, and PTFE | 0.2, 0.45 | Ideal for small volume pressure filtration |
| Disc Filters | Yes | 50 | PTFE | 0.2 | Ideal for filtering solvents and gases |
| Vacuum Filter Storage Systems** | Yes | 42, 49.5, 63, 79 | PES, CA, CN, and NY | 0.1, 0.2, 0.22, and 0.45 | Easy grip bottles for storing filtrate |
| Bottle Top Vacuum Filters** | Yes | 42, 63, 79 | PES, CA, and NY | 0.2, 0.22, and 0.45 | 2 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 NY | 0.22 and 0.45 | Ideal for purifying DNA from agarose gels |
| FiltrEX™ 96-well and 384-well Filter Plates | Some | 6.4, 3.2 | PVDF, Glass Fiber, PES, NC, and UF | 0.2, 0.45, 1.2, and others | Clear, opaque, or solvent resistant* |

*Call for specific details; several custom-made products available.

**Membrane design is square.

RC = regenerated cellulose, PES = polyethersulfone, SFCA = surfactant-free cellulose acetate, NY = nylon, PTFE = polytetrafluorethylene, CA = cellulose acetate, CN = cellulose nitrate, PVDF = polyvinylidene fluoride, NC = nitrocellulose, UF = ultrafiltration.

Selecting the Best Spin-X® UF Concentrator for Your Application

Spin-X UF concentrators are disposable, single use only ultra-filtration devices with polyethersulfone membranes (PES) for the centrifugal concentration and/or purification of biological samples. This guide will help you choose the best Spin-X UF concentrator for your application.

Major Uses for Ultrafiltration

Ultrafiltration is a convective process that uses anisotropic semi-permeable membranes to separate macromolecular species and solvents primarily on the basis of size. It is particularly appropriate for the concentration of macromolecules and can also be used to purify molecular species or for solvent exchange (Table 6). Ultrafiltration is a gentle, non-denaturing method that is more efficient and flexible than alternative processes.

Solute Concentration

Ultrafiltration membranes are used to increase the solute concentration of a desired biological species. The filtrate is cleared of macromolecules which are significantly larger than the retentive membrane pores. Microsolute is removed convectively with the solvent.

Solute Desalting or Purification

A solution may be purified from salts, non-aqueous solvents and generally from low molecular weight materials. Multiple solvent exchanges will progressively purify macromolecules from contaminating solutes. Microsolutes are removed most efficiently by adding solvent to the solution being ultrafiltered at a rate equal to the speed of filtration. This is called diafiltration.

Choosing the Right Concentrator

Corning offers Spin-X UF concentrators in three sizes. The information below and Tables 7 and 8 will help you find the best concentrator for your needs.

1. Spin-X UF 500 for 100 to 500 µL Samples

Spin-X UF 500 µL centrifugal filter units offer a simple, one step procedure for sample preparation. They can effectively be used in fixed angle rotors accepting 2.2 mL centrifuge tubes.

The vertical membrane design and thin channel filtration chamber minimizes membrane fouling and provides high speed concentrations, even with particle laden solutions.

2. Spin-X UF 6 for 2 to 6 mL Samples

Spin-X UF 6 mL concentrators have been developed to offer increased volume flexibility and performance. Spin-X UF 6 concentrators can process up to 6 mL in swing bucket or fixed angle rotors accepting standard 15 mL conical bottom tubes. In a single spin, solutions can be concentrated in excess of 100-fold. Samples are typically concentrated in 10 to 30 minutes with macromolecular recoveries in excess of 95%.



Table 6. Typical Ultrafiltration Applications

- ▶ General purpose laboratory concentration and desalting of proteins, enzymes, cells, biomolecules, antibodies, and immunoglobulins
- ▶ Removal of labeled amino acids and nucleotides
- ▶ HPLC sample preparation
- ▶ Deproteinization of samples
- ▶ Recovery of biomolecules from cell culture supernatants, lysates

The Spin-X UF 6 features twin vertical membranes for unparalleled filtration speeds and 100x plus concentrations. Remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead stop pocket further simplifies direct pipet recovery of the final concentrate.

3. Spin-X UF 20 for 5 to 20 mL Samples

Spin-X UF 20 mL centrifugal concentrators have been developed to offer increased volume flexibility and performance. Spin-X UF 20 handles up to 20 mL in swing bucket centrifuges and 14 mL in 25° fixed angle rotors accepting 50 mL centrifuge tubes.

Featuring twin vertical membranes for unparalleled filtration speeds the Spin-X UF 20 can achieve 100x plus concentrations. Remaining volume is easy to read off the printed scale on the side of the concentrator and the modified dead stop pocket further simplifies direct pipet recovery of the final concentrate.

Choosing the Best Molecular Weight Cut-off (MWCO) Membrane

Spin-X® UF concentrators use general purpose polyethersulfone membranes that provide excellent performance with most solutions when retentate recovery is of primary importance. Polyethersulfone membranes exhibit no hydrophobic or hydrophilic interactions and are usually preferred for their low fouling characteristics, exceptional flux and broad pH range.

The advanced designs and low adsorption materials that characterize Spin-X UF products offer a unique combination of faster processing speeds and higher recovery of the concentrated sample. Providing that the appropriate device size (Table 7) and membrane cut-off (Table 8) is selected, Spin-X UF products will typically yield recoveries of the concentrated sample in excess of 90% when the starting sample contains over 0.1 mg/mL of the solute of interest (Table 9). Most of the loss is caused by non-specific binding both to the membrane surface and to exposed binding sites on the plastic of the sample container.

Adsorption to the Membrane

Depending on sample characteristics relative to the membrane type used, solute adsorption on the membrane surface is typically 2 to 10 µg/cm². This can increase to 20 to 100 µg/cm² when the filtrate is of interest and the solute must pass through the whole internal structure of the membrane. Typically, a higher cut-off membrane will bind more than a low molecular weight cut-off membrane.

Adsorption to the Sample Container

Although every effort is made to minimize this phenomenon by the selection of low adsorption materials and tool production to optical standards, some solute will bind to the internal surface of the sample container. While the relative adsorption will be proportionately less important on the sample container than on the membrane, due to the higher total surface area, this can be the major source of yield loss.

Table 7. Technical Properties of Spin-X UF Concentrators

| Concentrator | Spin-X UF 500 | Spin-X UF 6 | Spin-X UF 20 |
|----------------------------------|---------------------|---------------------|---------------------|
| Concentrator Capacity | | | |
| Swing Bucket Rotor | Do not use | 6 mL | 20 mL |
| Fixed Angle Rotor | 500 µL | 6 mL | 14 mL |
| Minimum Rotor Angle | 40° | 25° | 25° |
| Dimensions | | | |
| Total Length | 50 mm | 122 mm | 116 mm |
| Width | 11 mm | 17 mm | 30 mm |
| Active Membrane Area | 0.5 cm ² | 2.5 cm ² | 6.0 cm ² |
| Membrane Hold Up Volume | <5 µL | <10 µL | <20 µL |
| Dead Stop Volume* | 5 µL | 30 µL | 50 µL |
| Materials of Construction | | | |
| Body | PC | PC | PC |
| Filtrate Vessel | PP | PC | PC |
| Concentrator Cap | PP | PP | PP |
| Membrane | PES | PES | PES |

*Dead stop volume as designed in molding tool. This volume may vary depending on sample, sample concentration, operation temperature, and centrifuge rotor.
PC = polycarbonate, PP = polypropylene, PES = polyethersulfone.

Table 8. PES Membrane Selection Guide (Recommended MWCO*)

| Application | <5,000 | 10,000 | 30,000 | 50,000 | 100,000 |
|-----------------|--------|--------|--------|--------|---------|
| Bacteria | | | | | ■ |
| Enzymes | ■ | ■ | | | |
| Growth factors | ■ | ■ | | | |
| Immunoglobulins | | | ■ | ■ | ■ |
| MAB | | | ■ | ■ | ■ |
| Peptides | ■ | | ■ | ■ | |
| Virus | | | ■ | ■ | ■ |
| Yeast | | | | | ■ |

*For highest recovery, select a membrane MWCO which is at least half of the molecular weight of the solute to be retained.

Table 9. Spin-X UF Concentrators Performance Characteristics
(Time in minutes to concentrate up to 30x at 20°C and solute recovery %)

| Concentrator | Spin-X UF 500 | | Spin-X UF 6 | | | | Spin-X UF 20 | | | |
|------------------------------------|--------------------|------|-----------------|------|--------------------|------|-----------------|------|--------------------|------|
| | 40° Fixed Angle | | Swing Bucket | | 25° Fixed Angle | | Swing Bucket | | 25° Fixed Angle | |
| Start Volume | 500 µL | | 6 mL | | 6 mL | | 20 mL | | 14 mL | |
| | Min. | Rec. | Min. | Rec. | Min. | Rec. | Min. | Rec. | Min. | Rec. |
| BSA 1.0 mg/mL (66,000 MW) | | | | | | | | | | |
| 5,000 MWCO PES | 15 | 96% | 20 | 98% | 12 | 98% | 23 | 99% | 29 | 99% |
| 10,000 MWCO PES | 5 | 96% | 13 | 98% | 10 | 98% | 16 | 98% | 17 | 98% |
| 30,000 MWCO PES | 5 | 96% | 12 | 98% | 9 | 97% | 13 | 98% | 15 | 98% |
| IgG 0.25 mg/mL (160,000 MW) | | | | | | | | | | |
| 30,000 MWCO PES | 10 | 96% | 18 | 96% | 15 | 95% | 27 | 97% | 20 | 95% |
| 50,000 MWCO PES | 10 | 96% | 17 | 96% | 14 | 95% | 27 | 96% | 22 | 95% |
| 100,000 MWCO PES | 10 | 96% | 15 | 91% | 12 | 91% | 25 | 91% | 20 | 90% |

Helpful Hints

Flow Rate

Filtration rate is affected by several parameters, including MWCO, porosity, sample concentration, viscosity, centrifugal force and temperature. Expect significantly longer spin times for starting solutions with over 5% solids. When operating at 4°C, flow rates are approximately 1.5 times slower than at 25°C. Viscous solutions such as 50% glycerin will take up to 5 times longer to concentrate than samples in a predominantly buffer solution.

Pre-rinsing

Membranes fitted to Spin-X® UF concentrators contain trace amounts of glycerin and sodium azide. Should these interfere with analysis, they can be removed by rinsing fill volume of buffer solution or deionized water through the concentrator. Decant filtrate and concentrate before processing sample solution. If you do not want to use the pre-rinsed device immediately, store it in the refrigerator with buffer or water covering the membrane surface. Please do not allow the membrane to dry out.

Sterilization of Polyethersulfone Membranes

Polyethersulfone membranes should not be autoclaved as high temperatures will substantially increase membrane MWCO. To sanitize or sterilize these devices, use a 70% ethanol solution or sterilizing gas mixture.

Optimizing Solute Recovery

When highest solute recoveries are most important, in particular when working with solute quantities in the microgram range, Corning recommends considering the following key points:

- ▶ Select the smallest device that suits the sample volume. Additionally, take advantage of the extra speed of Spin-X UF concentrators by refilling a smaller concentrator repeatedly.
- ▶ Select the lowest MWCO membrane that suits the application.
- ▶ When available, use swing bucket rotors rather than fixed angle rotors. This reduces the surface area of the concentrator that will be exposed to the solution during centrifugation.
- ▶ Reduce centrifugal force to approximately half of the maximum recommended (Table 10).
- ▶ Avoid over concentration. The smaller the final concentrate volume, the more difficult it is to achieve complete recovery. If feasible, after a first recovery, rinse the device with one or more drops of buffer and then recover again.
- ▶ Pretreat the device overnight with a passivation solution, such as 5% SDS, Tween 20, or Triton® X in distilled water. Then, rinse thoroughly before use.

Table 10. Maximum Recommended Centrifugal Force

| Concentrator | Spin-X UF 500 | Spin-X UF 6 | Spin-X UF 20 |
|---|------------------|----------------|-----------------|
| Maximum Centrifugal Force – Swing Bucket | | | |
| 5,000 to 50,000 MWCO | | | |
| PES | Do not use | 4,000 x g | 5,000 x g |
| >100,000 MWCO PES | Do not use | 4,000 x g | 3,000 x g |
| Maximum Centrifugal Force – Fixed Angle | | | |
| 5,000 to 50,000 MWCO | | | |
| PES | 15,000 x g | 10,000 x g | 8,000 x g |
| >100,000 MWCO PES | 15,000 x g | 6,000 x g | 6,000 x g |

Table 11. Chemical Compatibility*

(2-hour contact time; compatible pH range, pH 1-9)

| | | | |
|-------------------------------|---|-------------------------------|---|
| Acetic Acid (25.0%) | 1 | Lactic Acid (5.0%) | 1 |
| Acetone (10.0%) | 3 | Mercaptoethanol (10 mL) | 1 |
| Acetonitrile (10.0%) | 3 | Methanol (60%) | 2 |
| Ammonium Hydroxide (5.0%) | 2 | Nitric Acid (10.0%) | 1 |
| Ammonium Sulphate (saturated) | 1 | Phenol (1.0%) | 2 |
| Benzene (100%) | 3 | Phosphate Buffer (1.0M) | 1 |
| n-Butanol (70%) | 1 | Polyethylene Glycol (10%) | 1 |
| Chloroform (1.0%) | 3 | Pyridine (100%) | 2 |
| Dimethyl Formamide (10.0%) | 2 | Sodium Carbonate (20%) | 2 |
| Dimethyl Sulfoxide (5.0%) | 1 | Sodium Deoxycholate (5.0%) | 1 |
| Ethanol (70.0%) | 1 | Sodium Dodecylsulfate (0.1M) | 1 |
| Ethyl Acetate (100%) | 3 | Sodium Hydroxide | 3 |
| Formaldehyde (30%) | 1 | Sodium Hypochlorite (200 ppm) | 2 |
| Formic Acid (5.0%) | 1 | Sodium Nitrate (1.0%) | 1 |
| Glycerine (70%) | 1 | Sulfamic Acid (5.0%) | 1 |
| Guanidine HCl (6M) | 1 | Tetrahydrofuran (5.0%) | 3 |
| Hydrocarbons, aromatic | 3 | Toluene (1.0%) | 3 |
| Hydrocarbons, chlorinated | 3 | Trifluoroacetic Acid (10%) | 1 |
| Hydrochloric Acid (1M) | 1 | Tween 20 (0.1%) | 1 |
| Imidazole (500 mM) | 1 | Triton X-100 (0.1%) | 1 |
| Isopropanol (70%) | 1 | Urea (8M) | 1 |

*1 = acceptable, 2 = questionable, testing advised, 3 = not recommended.

Chemical Compatibility

Spin-X UF concentrators are designed for use with biological fluids and aqueous solutions. For chemical compatibility details, refer to Table 11.

Characteristics of Corning® Plasticware

| | Polystyrene (PS) | Polyethylene (High Density) | Polypropylene (PP) | Polycarbonate (PC) | Nylon (NY) | Polytetrafluorethylene (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 | 147-175°F 64-80°C | 250°F 121°C | 275°F 135°C | 280-290°F 138-143°C | 300-356°F 150-180°C | 250°F 121°C | 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* | | | | | | | |
| O ₂ | Low | High | High | Very low | Very low | – | Very low |
| N ₂ | Very low | Low | Low | Very low | Very low | – | Very low |
| CO ₂ | High | Very high | Very high | Low | – | – | Low |

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

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.

Chemical Compatibility of Corning® Plasticware

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

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

R = Recommended, L = Limited resistance, N = Not recommended, O = Testing advised, F = Fair, G = Good, P = Poor.

PP = polypropylene, PVC = polyvinyl chloride, CA = cellulose acetate, PC = polycarbonate, PTFE = polytetrafluoroethylene PS = Polystyrene, CN = cellulose nitrate, NY = Nylon, MCE = mixed cellulose esters, PET = polyethylene terephthalate.

Characteristics of Corning Centrifuge Tubes

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

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

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

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

Suggestions for Safe Centrifugation

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

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

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

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

nominal capacity with water and spun in a horizontal rotor centrifuge for 5 minutes. The centrifuge must be equipped with the recommended carriers, adapters, and cushions that fully support the tubes. If an angle head rotor is used or proper support is not provided, RCF values will be lower. Use of liquid other than water may also lower RCF values. Please consult your centrifuge specifications and the nomogram table (page G34) to determine speeds at which maximum RCF is achieved.

Chemical Compatibility of Disposable Plastic Centrifuge Tubes

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

Physical Properties of Disposable Plastic Centrifuge Tubes

| | Clear Polypropylene | New Polyethylene Terephthalate |
|----------------------------------|---------------------|--------------------------------|
| Recommended Working Temperature* | 0-40°C | 0-40°C |
| Heat Distortion Point | 121°C | 70°C |
| Flexibility | Moderate | Rigid |
| Transparency | Clear | Clear |
| Maximum RCF: | | |
| 15 mL Tube | 12,000 x g | 3,600 x g |
| 50 mL Tube | 15,500 x g | 3,600 x g |
| 250 mL Tube | 6,000 x g | — |
| 500 mL Tube | 6,000 x g | — |

*At room temperature for 24 hours.

Chemical Resistance of Disposable Plastic Centrifuge Tubes*

| Chemical Class | Polyethylene Terephthalate | Polypropylene | Polyethylene Caps |
|----------------|----------------------------|----------------|-------------------|
| Acids (weak) | 1 | 1 | 1 |
| Acids | 3 | 1 | 1 |
| Alcohols | 1 | 1 | 1 |
| Aldehydes | 3 ^a | 2 ^a | 1 |
| Bases | 3 | 1 | 1 |
| Esters | 2 | 2 | 2 |
| Hydrocarbons: | | | |
| Aliphatic | 1 | 2 | 3 |
| Aromatic | 3 | 3 ^b | 3 |
| Halogenated | 3 | 3 | 3 |
| Ketones | 2 | 2 ^c | 2 |

*At room temperature for 24 hours.

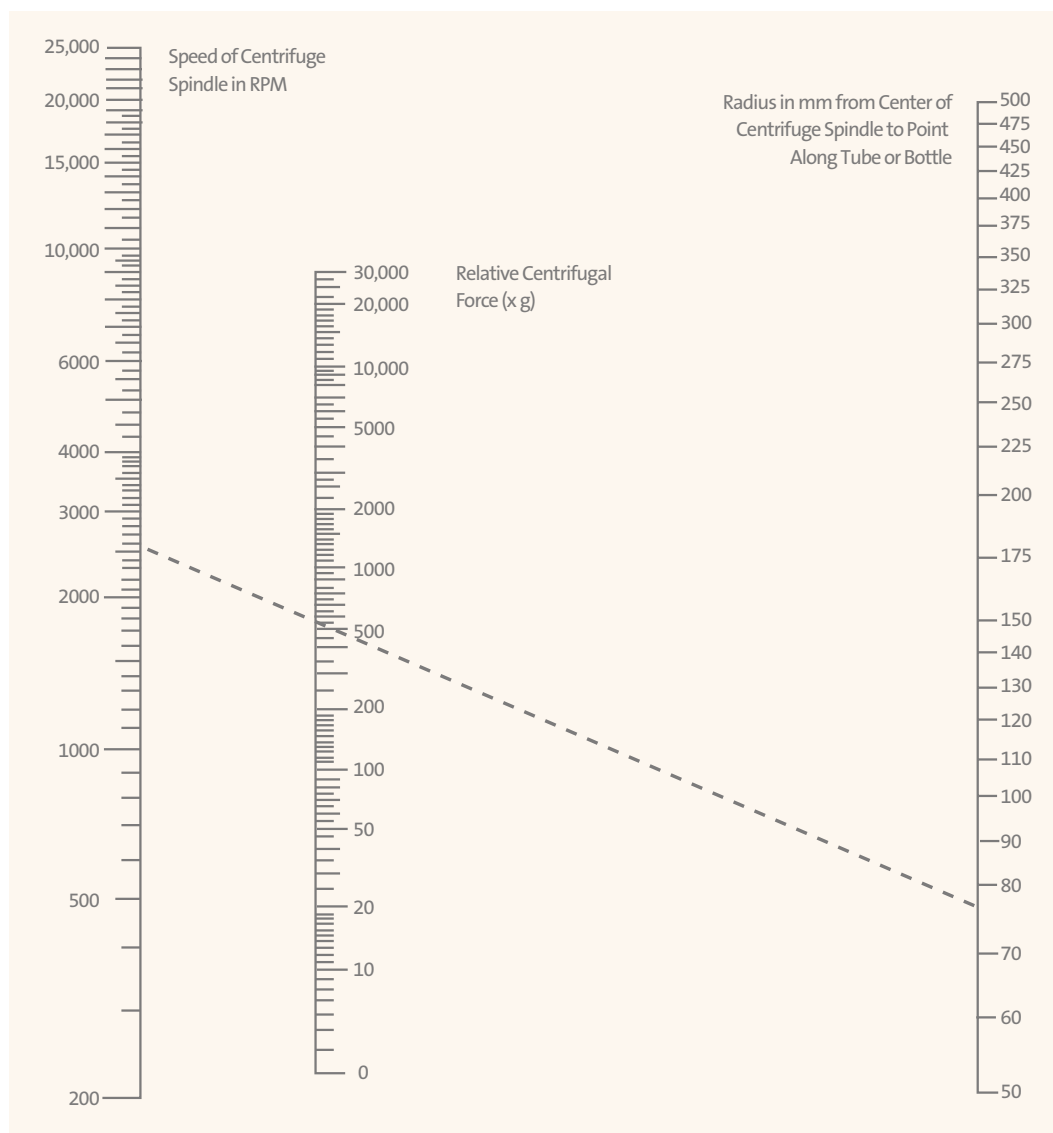
1 = Recommended, 2 = Suitable for most applications. However, a trial run under specific operating conditions is recommended, 3 = Not recommended.

^aFormaldehyde, rated 1.

^bPhenol, rated 1.

^cAcetone, rated 1.

Nomogram for Computing Relative Centrifugal Force



All data subject to normal manufacturing variations.

To calculate the RCF value at any point along the tube or bottle, measure the radius, in millimeters (mm), from the center of the centrifuge spindle to the particular point. Draw a line from the radius value on the right hand column to the appropriate centrifuge speed on the left-hand column.

The RCF value is the point where the line crosses the center column. The nomogram is based on the formula:

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

where:

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

N = Speed of spindle in RPM

Note: Tubes should not be spun in excess of 1500 x g.

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Corning Incorporated Life Sciences Europe

Corning BV
Fogostraat 12
1060 LJ Amsterdam
The Netherlands
Phone: +31 (0) 20 659 60 51
Fax: +31 (0) 20 659 76 73
CSEurope@corning.com
www.corning.com/lifesciences

Support Offices

EUROPE

France
t 0800 916 882
f 0800 918 636
Germany
t 0800 101 1153
f 0800 101 2427

The Netherlands
t 31 20 655 79 28
f 31 20 659 76 73
United Kingdom
t 0800 376 8660
f 0800 279 1117

All Other European Countries
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