VOLUME 1 • 2017

VWR®
We Enable Science

ProductionInsight

Solutions for Critical Environments & Manufacturing Processes

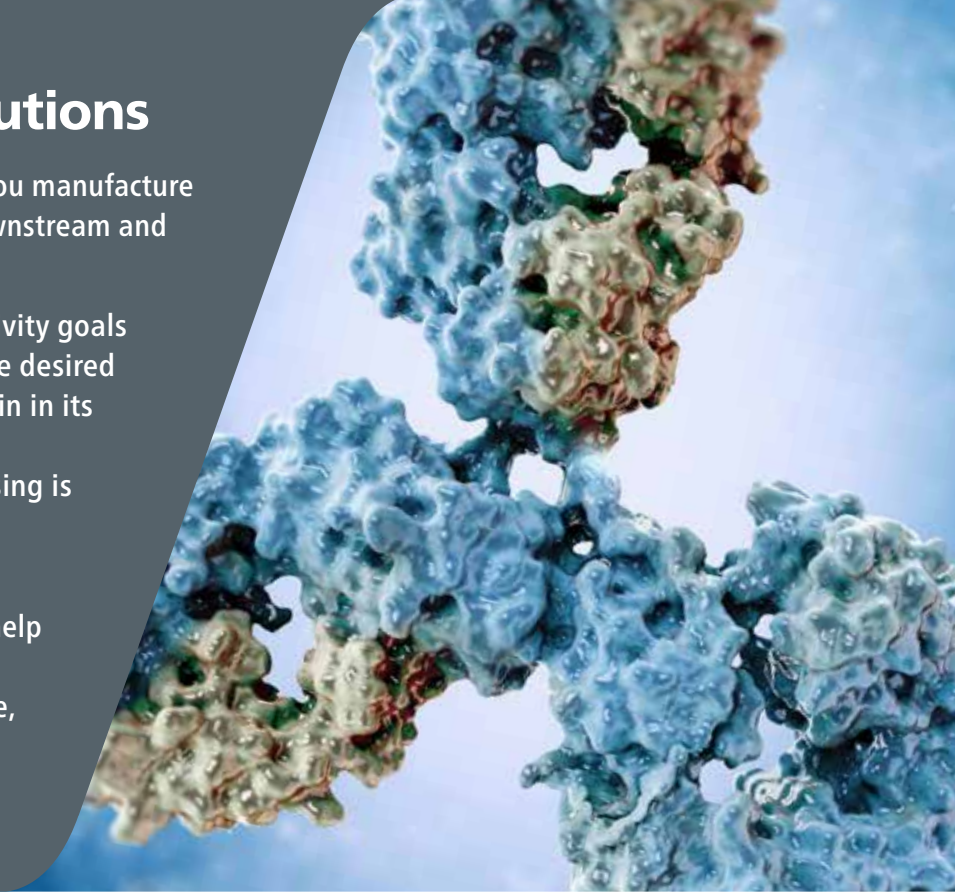
VWR Bioprocessing Solutions

VWR has solutions to address your needs as you manufacture your biologic of interest during upstream, downstream and final fill steps.

Achieving maximum cell density and productivity goals in your bioreactor, capturing and purifying the desired protein, and dispensing the formulated protein in its patient-ready configuration are not mutually exclusive objectives. Each stage of bioprocessing is influenced by the steps preceding it.

VWR's team of industry and technical experts understand these holistic influences and can help identify solutions that will meet your needs through product choice, operational excellence, and differentiated services.

Learn more at **vwr.com**/bioprocessing



All prices in US dollars

Making it easier to do business with us!

Updated order information...

when you need it...

delivered the way you want it!

We'll tell you when your order ships and when there is a change to its estimated arrival date. As an added benefit, you can choose how you would like to receive these notifications. No more guessing when your order will arrive!

Experience vwr.com in a new way!

- Advanced search options
- Easy access to product and service solutions based on your interests
- Enhanced order status with real time updates, links to certificates, invoices and packing slips

VWR COLLECTION

VWR® CERTICLEAN® Class 10 Nitrile Gloves

Ambidextrous, powder-free gloves with beaded cuffs for strength and reduction of cuff roll down. The 30.5 cm (12") length and tapered cuff provide more coverage over the garment sleeve.

- Long, tapered beaded cuff
- Superior strength and puncture resistance
- Color: White
- Textured fingertips for a reliable grip
- Film thickness designed for comfort and tactile sensitivity

Size	Cat. No.	Case of 1000
X-Small	40101-353	624.90
Small	40101-352	624.90
Medium	40101-354	624.90
Large	40101-356	624.90
Large+	40101-357	624.90
X-Large	40101-358	624.90

VWR COLLECTION

VWR® Advanced Protection Face Masks

Masks offer excellent bacteria and particulate protection, and are available in multiple styles to provide security and comfort throughout extended use. Masks feature three-ply construction for excellent particle and bacterial filtration efficiency. Available in two styles, with spandex ear loops or polypropylene ties ultrasonically welded to maintain softness and protect against particulates.

- Guards against bacteria and particulates
- Highly breathable and fluid resistant
- Malleable noseband ensures custom, secure seal
- Soft and hypoallergenic

Color	Cat. No.	Case of 500
Mask with Ear Loops		
Green	414004-663	197.91
Pink	414004-664	197.91
Blue	414004-662	197.91
Yellow	414004-665	194.05
Mask with Ties		
Blue	414004-666	197.13

Shop **vwr.com** for additional packaging options.

VWR COLLECTION

VWR® Disposable Goggles, Sterile

Individually bagged to provide optimum comfort for extended wear times.

- Two types of ventilation
- Produced under stringent conditions
- Monitored closely to ensure high quality
- Anti-fog and anti-scratch
- Fits over prescription glasses

Goggles come in two types of ventilation: indirect and direct. Produced under stringent conditions and monitored closely to ensure high levels of quality for every pair. The goggles passed tests according to the American National Standard for Occupational and Educational Personal Eye and Face Protective devices. Ideal for use in controlled environments requiring sterile apparel.

Ventilation	Cat. No.	Case of 100
Direct	10770-146	1028.72
Indirect	10770-152	1132.70

Kimtech Pure A6 Liquid Splash Protection Coverall

The Kimtech Pure A6 Liquid Splash Protection Coverall with Hood from Kimberly-Clark Professional provides superior liquid barrier protection along with a breathable back panel to keep workers in critical areas safe and cool. The new coverall is able to provide liquid splash protection and comfort in a single suit through two innovative, low-lint fabrics:

- High-performance laminated film for the front panel, hood, arms and legs
- ightweight, breathable filter material for the back panel to keep workers safe and cool

Suitable for ISO 7/8 and Grade C/D cleanrooms, the new coverall also offers:

- 94 percent Bacterial Filtration Efficiency (BFE)
- Built-in thumb loops and elastic cuffs
- Recyclable through RightCycle by Kimberly-Clark Professional
- Bulk packaging (25 individually packed coveralls per case)

Size	Cat. No.	Case of 25
Small	**75832-256**	**115.27**
Medium	**75832-258**	**116.81**
Large	**75832-260**	**122.95**
X-Large	**75832-262**	**127.57**
XX-Large	**75832-276**	**130.65**
3X-Large	**75832-278**	**142.94**
4X-Large	**75832-280**	**147.54**

VWR® CERTICLEAN® Class 100 Nitrile Gloves

- Ambidextrous
- Powder-free
- Feature a beaded cuff for strength and reduction of cuff roll down
- Strong, puncture-resistant construction
- Film thickness designed for comfort and tactile sensitivity
- Textured fingertips for a reliable grip
- 6.3 mil thick at fingers and 5.1 mil thick at palms, 25.4 cm (10") long
- Low particle count
- Color: white

Size	Cat. No.	Pack of 100	Case of 1000
X-Small	**40101-220**	**59.57**	**544.69**
Small	**40101-222**	**59.57**	**544.69**
Medium	**40101-224**	**59.57**	**544.69**
Large	**40101-226**	**59.57**	**544.69**
Large+	**40101-227**	**59.57**	**544.69**
X-Large	**40101-228**	**59.57**	**544.69**

VWR® COLLECTION

VWR® Glove Liners

Ergonomically designed glove liners are made from 15 denier, low-lint nylon knit fabric. Liners provide protection and comfort when used with latex, nitrile, and PVC gloves. Fully launderable for reusability and economy.

- Ambidextrous glove liners
- Reduces perspiration and wicks away moisture
- Sturdy, launderable, and reusable
- Color-coded cuffs indicate size
- Pre-laundered; will not shrink
- Color: White

Size	Cat. No.	Pack of 20	Case of 300
Half-Finger Liners			
Small	**94000-616**	**37.99**	**374.00**
Medium	**94000-618**	**37.99**	**374.00**
Large	**94000-620**	**37.99**	**374.00**
X-Large	**94000-622**	**37.99**	**374.00**
Full-Finger Liners			
Small	**94000-608**	**36.02**	**354.60**
Medium	**94000-610**	**36.02**	**354.60**
Large	**94000-612**	**36.02**	**354.60**
X-Large	**94000-614**	**36.02**	**354.60**
Full-Finger Liners, Extra Thick			
X-Large	**10124-750**	—	**630.66**

VWR® COLLECTION

VWR® Advanced Protection Sleeves

VWR® Advanced Protection Sleeves are manufactured from a specially formulated breathable microporous fabric that is exceptionally clean and durable.

- Significant fluid and particulate barrier
- Durable, lightweight fabric
- Excellent breathability and water vapor transmission rate
- Soft tactile feel
- Color: White

These protective garments provide a fluid barrier and dry-particulate protection, as well as resistance to common laboratory chemicals. Appropriate for industrial, pharmaceutical, food processing, construction, and certain environmental cleanup applications.

Size	Length	Cat. No.	Case of 300
Universal	49.5 cm (19½")	**414004-421**	**220.47**
X-Large	54.6 cm (21½")	**414004-420**	**257.34**

DuPont Controlled Environments Sterile Products Overview

When evaluating sterile cleanroom garments, make the selection that provides the most confidence in use

DuPont sterile cleanroom garments, designed for single use, offer meaningful advantages in today's challenging cleanroom environments:

- DuPont™ Tyvek® has been used to make high-quality cleanroom garments for more than 20 years
- The DuPont Controlled Environments Quality Management System (QMS) is ISO 9001 registered
- Quality documentation is readily available and accurate when requested to help meet customer requirements

DuPont™ Tyvek® IsoClean® Garments and Accessories[1]

Sterility Assurance	
What sterilization method is used?	Gamma irradiation
What company sterilizes the garments?	JPY Ion-Tech
Are the sterilization processes run by a strict set of documented procedures to ensure quality?	Yes
Is the company that sterilizes the garments ISO 9001 and ISO 13485 certified?	Yes
What is the sterility assurance level (SAL)?	10^{-6}
— At this SAL, what is the probability that the item is not sterile?	1 in 1,000,000
Are the minimum and maximum sterilization doses specified for the garments and accessories?	Yes
What standards are followed to determine the appropriate sterilization dose?	ISO 11137-1 & AAMI TIR33
— What method is used?	VD_{max} 30
Has dose mapping been completed?	Yes, per ISO 11137
Has bacteriostasis and fungistasis (B/F) testing been completed?	Yes
How was the sterility validation completed?	3 lot validation, including bioburden and sterility testing
Product Bioburden	
Is bioburden testing performed routinely?	Yes
What is the frequency of bioburden testing?	Quarterly
Sterilization Dose Auditing	
Are dose audits performed quarterly to assure the ongoing validity of the established sterilization dose?	Yes
Are there documented procedures to be implemented as a result of a dose audit failure?	Yes
What is tested during dose auditing?	Testing includes bioburden and sterility
Process Documentation	
Is a Certificate of Sterilization available for every shipment?	Yes
Is the following information provided in the sterilization documentation?	
— Lot number	Yes
— Actual minimum and maximum radiation dose received	Yes
— Sterility assurance level (SAL)	Yes
— Date sterilized	Yes
— Date product released	Yes
— Product part number	Yes
— Number of cases within the lot number	Yes
Is a Certificate of Compliance included with every shipment?	For all products packaged in ISO Class 4 and 5 cleanrooms
— Includes product part number and lot number	Yes
— Includes packaging date and irradiation indicator dot	Yes
What certificates are provided with the products?	Certificate of Compliance, Certificate of Sterility, Certificate of Irradiation

[1]This covers 0S, CS, DS and MS option codes

Packaging	
How are the garments and accessories packaged?	Multi-level. Dual case liners and an opaque, individual pouch (0S and CS) or dual case liners and an opaque, individual pouch with additional outer bag (MS and DS)
Is package integrity tested?[2]	Yes
— What test methods are used to test the package integrity?	Dye migration and burst testing
What is the expiration date of the packaging?	5 years
What is the packaging environment for 0S option items?	Items are packaged in an ISO 5 cleanroom
What is the packaging environment for CS, MS and DS option items?	Items are packaged in an ISO 4 cleanroom
Labeling	
Are the description, product part number and size of the garment located on the outer and inner packaging?	Yes
Is the lot number located on the packaging?	Yes
— Outer packaging — box label	Yes
— Inner packaging — pouch label	Yes
— Garment	Each individual garment package has a lot number
Is the expiration date located on the packaging?	
— Outer packaging — box label	Yes
— Inner packaging — pouch label	Yes
Is lot traceability maintained?	Yes
— How can garments be traced?	By lot number, or by the stamped traceability number
Consistent Functional Performance	
Do the physical properties of the garments (barrier, strength, linting) degrade due to repeated use, processing and exposure to sterilization?	Concerns do not apply to single-use sterile garments
Are garments being laundered with garments from a different manufacturing area or location?	No
Are garments folded to aid in aseptic gowning?	Yes
Are technical data sheets available?	Yes, see DuPont™ SafeSPEC™ (SafeSPEC.DuPont.com)
Is environmental monitoring conducted at the converting facilities?	Yes, in the ISO Class 4 and 5 cleanrooms, per ISO 14644
How is the product expiry date substantiated?	Items are tested after both natural and accelerated aging
What is the typical particle shedding performance[3] for CS, MS and DS options?	Helmke Category I
Product Life Cycle	
What is the usable life of the garment?	Single Use
— In terms of number of use cycles	1
— In terms of cumulative radiation	55 kGy maximum
How are garments removed at the end of their life cycle?	Dispose or recycle

[1]This covers 0S, CS, DS and MS option codes
[2]This covers testing of the opaque bag
[3]Data is typical performance and does not comprise a product specification

Two of the most popular products in the DuPont Controlled Environments portfolio of single-use garments and accessories are:

DuPont™ Tyvek® IsoClean® Garments
DuPont™ Gripper® Shoe Covers and Boot Covers

Description	Packaging	Cat. No.	Case of
Coverall*	Individual	**89127-242**	25/ **472.38**
Coverall - Sterile*	Individual	**89127-246**	25/ **660.83**
Hood - Sterile*	Individual	**89125-650**	100/ **695.96**
Boot Covers - Sterile*	Individual	**89127-332**	100/ **376.55**
Frock	Bulk	**89125-634**	30/ **317.83**

*Clean-processed - processed to minimize particle shedding and individually packaged in an ISO Class 4 (FED-STD-209E Class 10/M2.5) cleanroom. All items listed above are DuPont™ Tyvek® IsoClean®
Visit **vwr.com/dupontprotection** for sizes, additional information, and options.

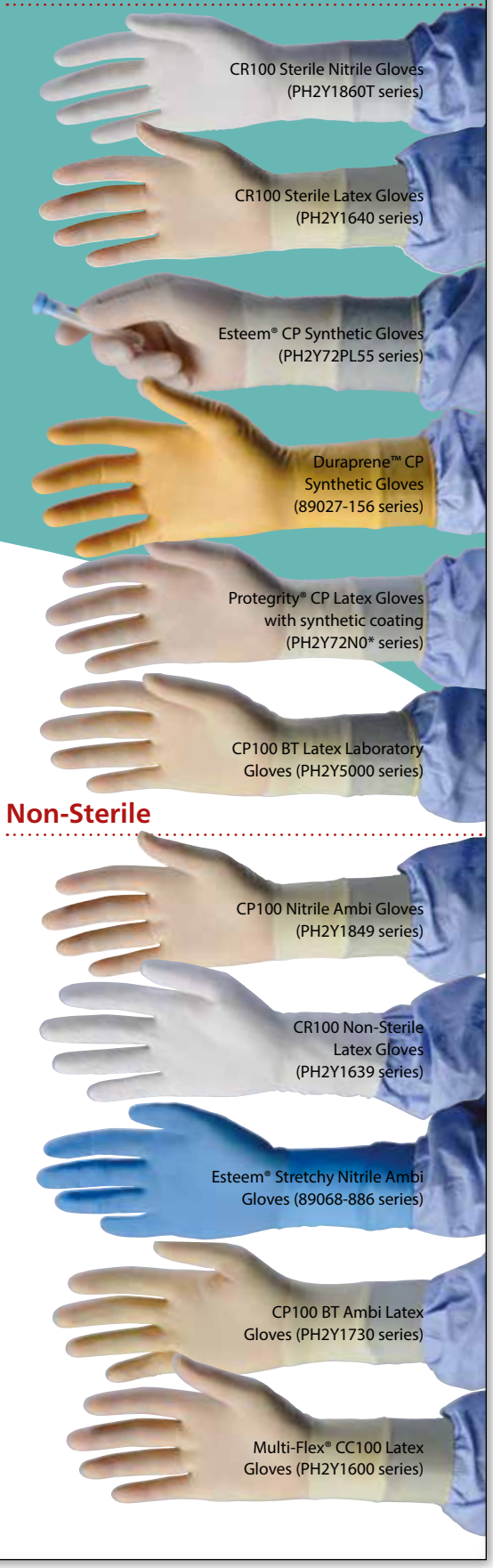
The Sterile Garment Evaluation Checklist is intended to be used as a tool to assist in choosing cleanroom garments for particular applications and does not replace the judgment of a qualified cleanroom manager.

Supplying the proper information is critical in order to obtain accurate guidance. Inaccurate data could result in an improper recommendation. DuPont DISCLAIMS ANY RESPONSIBILITY OR LIABILITY FOR GARMENTS SELECTED USING THIS STERILE GARMENT EVALUATION CHECKLIST, BASED ON ANY INCOMPLETE, INACCURATE, OR MISLEADING INFORMATION PROVIDED BY THE USER. There are other factors involved which could affect the final PPE (Personal Protective Equipment) decision and may not be considered in the Checklist. Sterile Garment Evaluation Checklist provides information on DuPont garment styles for particular applications. The final decision on garment selection is the responsibility of the cleanroom professional and end-user.

WARNING/CAUTION: There are uses and environments for which any garment will be unsuitable. It is the responsibility of the user to review available data and verify that the garment selected is appropriate for the intended use and meets all specified government and industry standards.

Cleanroom Gloves

Innovative solutions to meet your controlled environment needs



High-quality and **reliable** Cleanroom Gloves from Cardinal Health

Whether latex or synthetic, sterile or non sterile, hand-specific or ambidextrous, Cardinal Health offers a portfolio of gloves that will meet a wide variety of needs. Our gloves comply with ISO certification standards and options range from ISO 4 to ISO 7. Cardinal Health™ Cleanroom Gloves are clean-processed and designed to meet the demands of pharmaceutical, medical device producers, biotech and contract manufacturers in controlled environments, as well as professionals in lab research environments.

For additional information, or to place an order, please contact your VWR Sales Representative, call **800.932.5000** or visit **vwr.com/cardinalgloves**

*This specific product is not available in Canada. Please contact your VWR Sales Representative to learn about easy access to similar options available in your region.

CardinalHealth
Essential to care™

VWR Technical Product Support

Click-to-Chat Online Support available on select products Monday through Friday, 8:00 a.m. - 8:00 p.m. (EST)

With VWR Click-to-Chat, your answer is just a click away!

- Which wiper should I use in my cleanroom?
- Where can I get a Certificate of Analysis?
- Can you provide a data sheet for my lab coat?
- Can I get an MSDS for 190-proof pure ethanol?
- What class Nitrile glove should I order?

VWR is Your Total Solution Provider **for Controlled Environments**

Working in controlled environments requires the highest degree of expertise, experience, and diligence in order to ensure efficient and safe contamination control of both products and personnel. VWR Protection Apparel offers five levels of protection: Basic, Advanced, Maximum, Signature and Irradiated to obtain complete protection from head to toe. Our broad production supply line has everything from wipers to paper to disinfectants ensuring you have everything you need to operate efficiently in your controlled environment.

APPAREL

- Boot Covers
- Bouffant Caps
- Coveralls
- Face Shields
- Frocks
- Gloves
- Glove Liners
- Goggles
- Hoods
- Isolation Gowns
- Lab Coats
- Masks
- Shoe Covers
- Sleeves

PRODUCTION SUPPLIES

- Adhesive Mats
- Brushes
- Buckets
- Cleanroom Labels
- Cleanroom Mops
- Cleanroom Notebooks
- Cleanroom Paper
- Cleanroom Pens & Markers
- Cleanroom Tape
- Cleanroom Wipers
- Compliance Assistance
- Disinfectant - Sterile IPA
- Hand Care
- Sample Bags
- Sponges
- Storage Bins
- Swabs
- Tubing
- Wipers, Class 1-1000
- Wipers, Cleanroom Sterile
- Wipers, Pre-saturated

VWR® RETURNABLE CONTAINER ADVANTAGE PROGRAM (ReCAP)

Your facility thrives off these vital factors, and with VWR ReCAP, you are optimizing all three in one simple solution.

Performance | Convenience | Safety

Built on the foundation of supply chain innovation, VWR's Returnable Container Advantage Program (ReCAP) reliably delivers performance, convenience, and safety for your high-purity solvents.

The program starts with your choice of sealed 200L stainless steel containers, filled with BDH high-purity Acetonitrile or Methanol (choose your specification). Once at your facility, solvent can be safely dispensed without risking product contamination, spillage, or personal exposure. When the container is almost empty, let us know and we will replace it with a full one so your work remains uninterrupted.

- Inert gas pressurizes container to smoothly dispense high-purity solvent
- High quality and safety with 304 stainless steel
- Tamper-evident seal for peace of mind
- Relief valve for pressure regulation
- Convenience through Swagelok® Quick-Connects
- Serialized containers for precise tracking
- Integrated fork channels for hassle-free transport

US ONLY

Description	Standard Containers Cat. No.
Acetonitrile HiPerSolv CHROMANORM® Super Gradient for HPLC	**BDH83639.201**
Acetonitrile HiPerSolv CHROMANORM® LC-MS	**BDH83640.201**
Acetonitrile HiPerSolv Ultra Low Water for Biopharma	**BDH85500.201**
Acetonitrile for DNA Synthesis	**BDH85501.201**
Acetonitrile HiPerSolv CHROMANORM® Ultra LC-MS	**BDH83642.201**
Methanol HiPerSolv CHROMANORM® Ultra LC-MS	**BDH85800.201**
Methanol HiPerSolv CHROMANORM® Super Gradient for HPLC	**BDH85681.201**
Methanol HiPerSolv CHROMANORM® Gradient for HPLC	**BDH20864.201**

Standard Containers are industry-standard, single-wall construction 304 stainless steel drums.

This ReCAP program is not available in Canada. Please contact your VWR Sales Representative to learn about easy access to similar options available in your region.

approximately 200 lbs of glass, cardboard, and foam inserts are eliminated by each 200L container

Contact your VWR Production Chemical Specialist for more information.

USP Quality Water

Rocky Mountain Biologicals manufactures and distributes High Purity Water meeting or exceeding USP, EP, and ASTM requirements for a wide range of scientific research and biomanufacturing applications.

Water for Injection Quality, USP/EP
USP Water for Irrigation
USP Purified Water

RMBIO
Rocky Mountain Biologicals, Inc

Description	Size, L	Cat. No.	Each
Water for Injection, USP	1 x 6	**10837-190**	**90.00**
Water for Injection, USP	200	**10837-194**	**895.00**
Water for Irrigation, Sterile	1 x 6	**10837-196**	**78.00**
Water for Irrigation, Sterile	200	**10837-200**	**825.00**
Purified Water, Sterile	1 x 6	**10837-202**	**66.00**
Purified Water, Sterile	200	**10837-206**	**795.00**
Purified Water, Nonsterile	20	**10837-210**	**125.00**
Purified Water, Nonsterile	200	**10837-212**	**250.00**

This is a representative sample of the products available from RMBIO.
Contact your VWR Sales Representative for a complete size and price list of RMBIO High Purity Water, Saline, Salt Solutions, and Buffers.

Macco Organiques Inorganic Salts

Your mineral source for cGMP biopharmaceutical, pharmaceutical, diagnostic, and medical device applications.

High quality products for a wide variety of applications in life sciences. Chemicals are produced in contamination free areas and are packed in cleanrooms to ensure the highest possible level of quality is maintained at all stages. They are certified to ISO, GMP, Halal, and Kosher standards.

Description	Size, kg	Cat. No.
Ammonium Sulphate Woven Liner*	100	**10822-432**
Ammonium Sulphate Woven Liner*	50	**10017-908****
Ammonium Sulphate	12	**89234-890**
Calcium Chloride Dihydrate*	12	**89234-902**
Magnesium Chloride Hexahydrate*	12	**89234-906**
Potassium Chloride	12	**89234-920**
Potassium Phosphate Dibasic	12	**89523-434**
Potassium Phosphate Monobasic	12	**89523-436**
Potassium Phosphate Monobasic*	50	**89523-438**
Sodium Acetate Trihydrate*	12	**89234-924**
Sodium Bicarbonate	12	**10769-334**
Sodium Bicarbonate*	45.5	**89492-716**
Sodium Carbonate, Anhydrous	12	**89492-712**
Sodium Carbonate, Anhydrous*	45.5	**89492-714**
Sodium Chloride	12	**89234-934**

Description	Size, kg	Cat. No.
Sodium Chloride*	50	**10768-394****
Sodium Chloride*	100	**75784-218**
Sodium Citrate	12	**10799-200**
Sodium Citrate	50	**10799-212**
Sodium Dihydrogen Phosphate	12	**89523-442**
Sodium Hydroxide*	100	**75784-220**
Sodium Phosphate Dibasic Heptahydr	12	**89523-444**
Sodium Phosphate Dibasic Heptahydr	50	**10026-130**
Sodium Phosphate Dibasic Anhydrous	12	**10755-340****
Sodium Phosphate Dibasic Anhydrous*	50	**10755-746****
Sodium Phosphate Monobasic Monohydr	12	**89523-446****
Sodium Phosphate Monobasic Dihydr	12	**89523-440**
Sodium Sulphate, Anhydrous*	12	**89234-940**
Zinc Sulfate Heptahydrate*	12	**89234-946**
Zinc Sulphate Monohydrate*	12	**89221-804**

* Shipped in poly drums
** This specific product is not available in Canada. Please contact your VWR Sales Representative to learn about easy access to similar options available in your region.

For additional sizes, pricing, and information shop **vwr.com** or contact your VWR Production Chemical Specialist.

VWR® CATALYST
We Enable Science Through Services

WITH VWRCATALYST'S SUPPORT, YOUR BUSINESS CAN FOCUS ON MAINTAINING A COMPETITIVE EDGE IN THE MARKET

Our extensive portfolio of differentiated services can help you move faster and devote more time to your core production processes.

VWRCATALYST services reduce the burden of non-core and routine scientific tasks, from procurement through production process support.

We can help you re-focus your time on initiatives that directly support the strategic mission of your company.

We Enable Science by:

- Powering productivity
- Improving quality, safety, and regulatory compliance
- Reducing total operating costs

Over 1,200 **VWR**CATALYST associates are working worldwide today at industry leading pharmaceutical, biotech, educational, industrial, healthcare and high-tech production institutions.

Our services include:

- Procurement and Supply Management
- Laboratory and Production Support
- Science as a Service
- Equipment and Instrument Services
- Lean Six Sigma Laboratory Process Consulting

Learn more at **vwr.com/vwrcatalyst,** or contact us at **1.888.793.2300** or **vwrcatalyst@vwr.com.**

VWR Production Chemicals

Complexity Simplified

As a global chemical solutions provider, we offer reliable and transparent supply chain solutions designed to decrease the complexity you encounter. Manage the risk you face by harnessing our global strengths through Security, Services, Supply and Support. Learn more at **vwr.com/production-chemicals**.

SECURITY
MINIMIZE complexity — MAXIMIZE supply chain security

SUPPLY
SIMPLIFY procurement — STRENGTHEN strategic sourcing

SERVICES
INCREASE productivity — FOCUS on process development and manufacturing

SUPPORT
LEVERAGE global reach — GAIN local support

Shop **vwr.com** for additional information on VWR Production Chemicals or contact your local VWR Sales Representative.

VWR® Bioprocessing
We Enable Science Throughout the Process

VWR BIOPROCESSING SOLUTIONS

Enabling Your Process with Innovative Choice

UPSTREAM & CELL CULTURE

Enabling Your Scale-up with the Right Products and Quality Requirements

Whether your expressions system is prokaryotic (bacteria) or eukaryotic (mammalian, yeast), the biochemicals, supplements, and equipment we provide to grow organisms meet required quality and performance parameters that allows seamless transfer from R&D to pilot scale and onto manufacture scale.

- VWR Life Science Seradigm
- Fermentation Media & Additives
- Biological Buffers
- Inorganic Salts
- Sugars & Carbohydrates
- Proteins & Amino Acids
- Cell Culture Vessels
- Work Stations & CO_2 Incubators

DOWNSTREAM & FINAL FILL

Recovery and Purification Throughout the Filtration Steps and Ensuring Protein Stability, Solubility, and Bioavailability

We understand that quality and stability of your target protein must be maintained during the sequential purification steps of your process. VWR's portfolio of buffers and salts meet the quality and performance required to maintain protein attributes, and are available in powder form to allow preparation of solutions at concentrations defined during development or final buffer formulation.

- Biological Buffers
- Inorganic Salts
- Sugars & Carbohydrates
- Proteins & Amino Acids
- Chromatography Resins, Columns & Supplies
- Sterile Vials, Stoppers & Seals
- Excipients

ENVIRONMENTAL CONTROL

Leading the Way in Controlled Environment Conditions

You can rely on VWR when you need to ensure ultraclean manufacturing conditions for your production facility. This carefully selected portfolio is specifically designed to help you prevent potential contamination and maintain aseptic conditions in cleanrooms and controlled environments:

- Protective Apparel
- Cleanroom Gloves
- Cleaning Systems
- Detergents & Cleaners
- Wipers
- Production Supplies
- Mats & Flooring
- Labeling & Documentation
- Environmental Monitoring
- Biosafety Cabinets
- Tubing
- Swabs

VWR® Manufacturing
We Enable Science Through Custom Services

The Right Tools to Address the Complex Needs of Your Business

VWR has the right manufacturing solution for you.

With a well-established infrastructure of manufacturing facilities in North America and Europe, we provide a variety of production services across numerous applications and market segments.

OUR PRODUCTION SCALE SERVICES INCLUDE:

- Custom Re-Packaging and Testing
  - Custom Pack Sizes and Configurations
  - Custom Testing and Specifications
- Custom Intermediates for Production
  - Liquid Formulations
  - Powder Blends
- Contract Manufacturing (OEM)
  - Final Formulation
  - Liquid & Powder Reagents
  - Fill/Finish, Labeling, Kitting, & Assembly
- Custom Synthesis
  - R&D Process Development & Bench Scale Production
  - Production Scale Synthesis

VWR engineers and scientists will ensure the right processes and systems are used to meet your needs. Whether your product is in development or already commercialized, we can scale our systems appropriately.

Our systems are modular in design. So you can use all or a tailored selection of our production centers, equipment, and infrastructure. Whether you are an industry leader or new to the market, we have the right manufacturing solution to support your production and commercialization needs.

For more information, call **1.800.932.5000** or e-mail **VWRCustom@vwr.com**.

To learn more, watch our video at **vwr.com/manufacturing**

VWR BIOPROCESS CHEMICALS

NEW

VWR Bioprocessing Chemicals and Excipients

Bioprocessing Chemicals. More Product Solutions.

VWR manufactures commercial-scale cGMP biological buffers and biochemicals in addition to providing diverse sourcing capabilities. We can help you meet the increasingly rigorous sourcing and supply chain demands of the life science market.

Capabilities:

- Suitable for bioprocessing and excipient use
- BSE/TSE-Free
- Custom Packaging and Testing Available
- Three-Lot Sample Availability
- Standard Pack Sizes for Convenience
- Analytical Laboratory Support
- Regulatory Support
- Management of Change
- Supply Chain Transparency and Audit Support of Raw Materials Manufacturers

EXCiPACT

EXCiPACT™ international excipients certification

Products manufactured at our manufacturing sites in Solon and Aurora, OH are now EXCiPACT™ certified.

For further information, see vwr.com/excipact

Description	CAS No.	Formula	Molecular Weight	Grade	Available Sizes	Cat. No.
Amino Acid Derivatives						
Asparagine, Anhydrous	70-47-3	$C_4H_8N_2O_3$	132.12	Bioreagent	100g, 1kg, 5kg, 25kg	**VWRB15005**
L-Cystine Dihydrochloride	30925-07-6	$C_6H_{12}N_2O_4S_2 \bullet 2HCl$	313.23	Bioreagent	100g, 1kg, 5kg, 25kg	**VWRB21502**
Hypoxanthine Disodium Salt	102-32-9	$C_5H_2N_4O \bullet 2Na$	180.11	Bioreagent	100g, 1kg, 5kg, 25kg	**VWRB31608**
Hypoxanthine Sodium Salt	45738-97-4	$C_5H_3N_4O \bullet Na$	158.11	Bioreagent	100g, 1kg, 5kg, 25kg	**VWRB31752**
L-Lysine Anhydrous	56-87-1	$C_6H_{14}N_2O_2$	146.19	Bioreagent	100g, 1kg, 5kg, 25kg	**VWRB42307**
L-Tyrosine Disodium Dihydrate	122666-87-9	$C_9H_9NO_3Na_2 \bullet 2H_2O$	261.19	Bioreagent	100g, 1kg, 5kg, 25kg	**VWRB87058**
Biological Buffers						
HEPES Free Acid	7365-45-9	$C_8H_{18}N_2O_4S$	238.3	Bioreagent	1kg, 5kg, 25kg	**VWRB30487**
HEPES Sodium Salt	75277-39-3	$C_8H_{17}N_2O_4SNa$	260.3	Bioreagent	1kg, 5kg, 25kg	**VWRB30567**
PIPES Free Acid	5625-37-6	$C_8H_{18}N_2O_6S_2$	302.37	Bioreagent	1kg, 5kg, 25kg	**VWRB73007**
PIPES Disodium Salt	76836-02-7	$C_8H_{16}N_2O_6S_2Na_2$	346.33	Bioreagent	1kg, 5kg, 25kg	**VWRB73305**
PIPES Sequisodium Salt	100037-69-2	$C_{16}H_{33}N_4O_{12}S_4 \bullet 3Na$	670.69	Bioreagent	1kg, 5kg, 25kg	**VWRB73257**
TRIS Hydrochloride	1185-53-1	$C_4H_{11}NO_3HCl$	157.6	Bioreagent	1kg, 5kg, 25kg	**VWRB85827**
Tromethamine (TRIS)	77-86-1	$C_4H_{11}NO_3$	121.14	USP, EP, BP, JPC, Endotoxin Tested	500g, 2.5kg, 12kg, 50kg	**VWRB497**
Carbohydrates						
Dextrose, Anhydrous	50-99-7	$C_6H_{12}O_6$	180.16	USP, EP, BP, JP, Endotoxin Tested	1kg, 2.5kg, 12kg, 100lb, 200lb	**VWRBK876**
Chaotic Agents						
Urea	57-13-6	CH_4N_2O	60.06	USP, EP, BP, JP, Endotoxin Tested	500g, 12kg, 50kg	**VWRB568**
Inorganic Salts						
Ammonium Sulfate	7783-20-2	$H_8N_2O_4S$	132.14	ACS, NF, Endotoxin Tested	500g, 2.5kg, 12kg, 100kg	**VWRB191**
Calcium Chloride Dihydrate	10035-04-8	$CaCl_2 \bullet 2H_2O$	147.02	USP, EP, BP, JP, Endotoxin Tested	1kg, 12kg	**VWRB556**
Potassium Phosphate Monobasic, Anhydrous	7778-77-0	KH_2PO_4	136.09	NF, EP, BP, Endotoxin Tested	1kg, 12kg	**VWRB0781**
Sodium Chloride	7647-14-5	NaCl	58.44	USP, EP, BP, JP, Endotoxin Tested	1kg, 2.5kg, 12kg, 50kg, 350lb	**VWRB241**
Sodium Phosphate Dibasic, Anhydrous	7558-79-4	Na_2HPO_4	141.96	USP, EP, Endotoxin Tested	1kg, 12kg	**VWRB0404**
Sodium Phosphate Dibasic, Heptahydrate	7782-85-6	$Na_2HPO_4 \bullet 7H_2O$	268.07	ACS, USP, Endotoxin Tested	1kg, 12kg	**VWRB0348**
Sodium Phosphate Monobasic, Monhydrate	10049-21-5	$Na_2HPO_4 \bullet H_2O$	137.99	ACS, USP, BP, Endotoxin Tested	1kg, 12kg	**VWRB0823**
Sodium Sulfate, Anhydrous	7757-82-6	Na_2SO_4	142.04	USP, EP, Endotoxin Tested	500g, 2.5kg, 12kg, 100kg	**VWRB836**

The QuattroMix single-use mixing bag includes a 16-hole mixing plate that is built into the bag (shown here)

JM BioConnect QuattroMix™

An Innovative Single-Use Mixing System With Additional Benefits

By Dr. Andreas Frerix (Almatec), edited by Tom van der Veeken (JM Separations)

Introduction

The manufacturers of biopharmaceuticals must be cognizant of and be prepared to overcome a significant number of operational challenges—from both a micro and macro perspective—as they shepherd their products from production line to, ultimately, the hands of the consumer. The day-to-day (micro) challenges must all be consistently met, otherwise the production run will be a failure. Since many biopharmaceuticals are extremely sensitive to change or damage from outside influences, the main challenges for manufacturers typically include:

- Maintaining a high level of purity and sterility
- Achieving low levels of leachables and extractables
- Minimizing impact of particle shedding from contact materials contaminating the product stream
- Utilizing shear-sensitive product handling
- Producing a controlled, constant product flow with low pulsation
- Minimizing addition of heat to the production process
- Achieving a high level of volumetric consistency

From the big-picture (macro) perspective, biopharmaceutical manufacturers are most commonly confronted with the following concerns:

- Optimizing equipment and maintenance costs
- Increasing speed-to-market capabilities
- Reduce overall costs to address the competitive environment.

The only way to achieve success in meeting these challenges, both small and large, is by incorporating production equipment and systems that reliably perform efficiently and effectively. Finding and utilizing the proper technology will help the biopharmaceutical manufacturer defeat the many challenges inherent in the production process, while providing peace-of-mind knowledge that the needs of the consumer will be met satisfactorily.

A New Company Emerges to Meet This Challenge

Two decades ago, friends and colleagues, Mark van Trier and John van der Veeken, set out to form their own company, the result of which was JM Separations BV, which they headquartered in Tilburg, The Netherlands. Over the years, the company's mission has evolved and JM Separations has become an engineering and design firm for the biopharmaceutical industry. "Over time we had more and more of a passion to have our own manufacturing, our own products, our own engineering team and supply the customer with process solutions," said Van Trier. "We really want to help customers with their solutions," added Van der Veeken. Since June, 2016 JM Separations has become part of VWR International, Inc.

In The Mix

A critical link in the biopharmaceutical-production chain is batch mixing, whether it's a liquid/liquid solution or a liquid/solid solution. The demands in batch mixing are similar to those of overall biopharmaceutical manufacturing: utilize a process that maintains the aseptic integrity of the product during manufacture, while delivering the capability to perform the mixing process in a time-sensitive and cost-effective manner.

In recent years, John and Mark observed the industry-wide growth of single-use equipment and especially mixing systems in combination with single-use pumps as an enabling technology that they could offer their customers. John and Mark believed this was a better manufacturing solution because of the low cost compared to permanent stainless steel mixing systems and the simultaneous ability to ensure the necessary level for optimal bioproduction that is required. Specifically, they felt they could fill a niche where batch-mixing operations could be performed and enhanced through the use of single-use pumping equipment.

For a solution, they reached to the past, in this case, to a former colleague Frank Glabiszewski, who had worked with Mark and John in the early 1990s. Since then, Glabiszewski had with partner Josef Zitron, invented the positive displacement quaternary (four-piston) diaphragm pumping principle and founded Quattroflow™ Fluid System GmbH & Co in Germany. The pump-heads of the Quattroflow™ Fluid System minimized particle shedding, which is very important for biopharmaceutical companies" said Van Trier. In 2010, JM Separations started working with Quattroflow to build a mixing system. In 2013, JM Separations achieved that solution, identified as the JM BioConnect QuattroMix™ Single-Use Mixing System, featuring a Quattroflow Quaternary (Four-Piston) Diaphragm Pump used to circulate the liquids and solids in a mixing bag in order to achieve the necessary mix and dilution rates, all within an optimized time frame.

Another benefit of the QuattroMix™ system is that filling, mixing, emptying and post-mixing filtration steps can all be accomplished by utilizing the same Quattroflow™ pump.

All That, And So Much More

The JM BioConnect QuattroMix system has a very basic, easy-to-understand operating principle. A single-use mixing bag is filled via a Quattroflow pump through a 16-hole mixing plate that is built into the bag. After the proper amount of mixing agent is injected into the mixing bag, the Quattroflow's pumping action through the mixing plate forces the liquid from the bottom of the bag, up around the outer walls and back down through the mixing plate in the center, where it is recirculated through the pump.

"Together with Quattroflow we have invented a state-of-the-art mixing system that is based on the technology of the pump with the mixing plate inside and incorporating technology from JM Separations, combining all of the parts together to make a single-use piece of process equipment. Since the Quattroflow pumps have a nice capacity, they can run up to 1,200 liters an hour (317 gph). We can mix liquid/liquid solutions and we can also mix liquid/powder solutions."

The unique, impeller-free operation of the JM BioConnect QuattroMix system also gives them distinct operational advantages over competitive types of mixing systems. "The challenge for other suppliers of mixing technologies is that most of the mixing systems have a magnetic part on them or they have an impeller. Some mixing solutions have magnetic beads so a magnetic part will not work with that application. If you have a mixer inside the bag it creates the chance for contamination on the impeller since the impeller has to go through the bag. This is something that you don't have with JM BioConnect QuattroMix system. You have a pre-packed complete unit with the pumphead next to it. You install it as a complete unit then install the disposable pumphead to the motor and start filling with water; basically it's a plug-and-play unit.

The Quattroflow pump is also versatile enough that it can be used for filling the JM BioConnect QuattroMix bag and to transfer the newly mixed solution from the mixing bag to a disposable storage unit without the need to utilize another pump. This decreases the chance that product contamination will occur.

Of course, the fact that the complete mixing system is a single-use application brings with it a whole host of operational benefits, namely:

- Lower initial cost than permanent stainless steel systems
- No expense of time or cost for equipment cleaning and validation
- Quicker production processes that optimize speed-to-market capabilities
- Easy removal and disposal of the system once production run is completed
- Ideal when clean-in-place or steam sterilization is not practical or possible

"In the biopharmaceutical industry, single-use has become more and more popular because our customers want the product to come to market as quickly as possible," said Van Trier. Companies do not want to spend time cleaning because cleaning and validation take a lot of time and also a lot of labor. With single-use you don't have to clean anymore, your operators can focus on making the product, get a new bag, put it in place for the next production run. It's cost effective when compared to stainless steel, and after 30 minutes the customer has his liquid prepared; which is the aim of the system.

Currently, JM BioConnect is offering the mixing system with mixing-bag capacities of 50, 200, 500, 1.000 and 1.500 liters (13 to 396 gallons). The JM BioConnect name is now registered in the United States and several countries in Europe and Asia, and its customer base has rapidly grown to include such global pharmaceutical giants as Johnson & Johnson, Pfizer and Novartis, as well as smaller companies that require customized mixing systems.

Conclusion

The challenges are many in the production of biopharmaceuticals, but if they can be properly identified and managed correctly, the benefits are immense for both consumers and the manufacturer. The only way that critical mixing applications can be completed successfully is if the proper equipment, from pumps to bags to hoses to connectors, is utilized.

"With this integrated system featuring Quattroflow pumps JM Separations eliminate a lot of problems other suppliers have including: minimal particle generation and chances of contamination, elimination of a magnetic field inside the bag, and the elimination of an extra pump to transfer the fluid to another place. All these things are built into the design of the system."

JM BioConnect QuattroMix systems will be designed customer-specific. Together with our product engineers the best match for your process will be found.

VWR gives customers the opportunity to run tests with the single-use mixing system. To discuss or JM BioConnect QuattroMix fits your process, or to receive more information about testing the system, please contact us at: **vwrsingleusesolutions@vwr.com.**

JM BioConnect® Pillow Bags

JM BioConnect® Pillow Bags are designed 2D-style and have hose barb ports heat-sealed into the bottom of the bag. The bags are available from 50mL to 50L volume. Pillow Bags are designed for hanging which facilitates complete fluid recovery and ease of handling.

The standard Pillow Bags are available with the following port configurations:

- C-Flex tubing with end-plugs meant for welding
- Silicone platinum tubing with luer lock-connectors
- Silicone platinum tubing with MPC-connectors

JM BioConnect® Pillow Bags are made of high-quality JMS Flex Film, which consist of a ULDPE fluid contact layer and a LDPE outer layer. A high oxygen barrier layer (EVOH) is coextruded between both layers. The bag film has a high clarity and flexibility and is resistant to a wide range of chemicals. The bag film is:

- Compliant to EP 3.1.5
- Compliant to ISO 10993-4, -5, -6, -10, -11
- USP Class VI
- Animal derived component free (ADCF)

The Pillow Bags will be delivered gamma irradiated and ready-to-use.

VWR is also able to deliver customer-specific JM BioConnect® Pillow Bags or other bag designs like 3D Cubic Bags and Mixing Bags. For more information, please visit **vwr.com/single-use**.

Description	Capacity	Cat. No.	Case of
2-Port Pillow Bags			
2 Ports for Welding	50 mL (1.69 oz)	**75874-848**	50/ **847.00**
2 Ports for Welding	500 mL (16.9 oz)	**75874-850**	35/ **626.78**
2 Ports for Welding	1 L (33.8 oz)	**75874-354**	30/ **573.54**
2 Ports Luer	50 mL (1.69 oz)	**75874-364**	50/ **883.30**
2 Ports Luer	500 mL (16.9 oz)	**75874-366**	35/ **652.19**
2 Ports Luer	1 L (33.8 oz)	**75874-368**	30/ **588.06**
2 Ports MPC	50 mL (1.69 oz)	**75874-370**	50/ **1113.20**
2 Ports MPC	500 mL (16.9 oz)	**75874-372**	35/ **813.12**
2 Ports MPC	1 L (33.8 oz)	**75874-374**	30/ **726.00**

Description	Capacity	Cat. No.	Case of
3-Port Pillow Bags			
3 Ports for Welding	5 L (1.3 Gal)	**75874-356**	15/ **479.16**
3 Ports for Welding	10 L (2.6 Gal)	**75874-358**	15/ **559.02**
3 Ports for Welding	20 L (5.3 Gal)	**75874-360**	15/ **751.41**
3 Ports for Welding	50 L (13.2 Gal)	**75874-362**	10/ **595.32**
3 Ports MPC	5 L (1.3 Gal)	**75874-376**	15/ **515.46**
3 Ports MPC	10 L (2.6 Gal)	**75874-378**	15/ **595.32**
3 Ports MPC	20 L (5.3 Gal)	**75874-380**	15/ **787.71**
3 Ports MPC	50 L (13.2 Gal)	**75874-382**	10/ **619.52**

Shop **vwr.com** for port sizes and additional product information.

JM BioConnect® Tank Liners

JJM BioConnect® Tank Liners are single-use bags with an open top, designed to fit in cylindrical vessels. These bags are used as liner into a vessel to avoid cleaning of the vessel after media and buffer preparation.

After installing the Tank Liner into a vessel and filling it with liquid, powder can be added to the vessel and the mixing process can start by using an overhead agitator. When mixing is finished, it's possible to pump the mixed liquid into sterile bags by using a sterile filter in order to have sterile media and buffers.

JM BioConnect® Tank Liners are made of a clean medical grade multi-layer film designed for bioprocess applications such as open-top Tank Liners. The fluid contact layer is a medical grade LLDPE.

To minimize gas diffusion, an EVOH layer is coextruded between the inner and outer layers. The outer, non-contact strength layer is formed from polyamide and is coextruded with PE to create a bonding layer. The film is USP Class VI and animal derived component free (ADCF).

The Tank Liners are available in both 2D and 3D style. The bags will be delivered gamma irradiated and ready-to-use.

VWR is also able to deliver customer-specific JM BioConnect® Tank Liners. The bags can be made for almost all vessels up to 1.500 L, optionally with bottom drain. For more information about customization, please visit **vwr.com/single-use**.

Capacity	Cat. No.	Case of
2D Tank Liners		
19 L (5 Gal)	**75874-384**	15/ **577.61**
38 L (10 Gal)	**75874-386**	10/ **400.17**
50 L (13.2 Gal)	**75874-388**	5/ **209.52**
100 L (26.4 Gal)	**75874-390**	4/ **193.28**
200 L (52.8 Gal)	**75874-392**	4/ **203.86**
300 L (79.2 Gal)	**75874-394**	3/ **176.69**
560 L (147.9 Gal)	**75874-396**	3/ **207.26**

Capacity	Cat. No.	Case of
3D Tank Liners		
50 L (13.2 Gal)	**75874-398**	8/ **392.62**
100 L (26.4 Gal)	**75874-400**	6/ **332.97**
200 L (52.8 Gal)	**75874-402**	5/ **294.47**
300 L (79.2 Gal)	**75874-404**	4/ **268.79**
560 L (147.9 Gal)	**75874-406**	3/ **233.31**

See **vwr.com** for additional product information.

VWR Single-Use Solutions

VWR Single-Use Solutions enables biopharmaceutical manufacturers to implement single use technologies that reduce contamination risk, improve resource efficiency, and lowers labor and energy costs. Our solution provides product choice, services, and the expertise to help navigate through the various fluid handling challenges, component options and quality and regulatory compliance constraints of the single-use world. At VWR, our goal is to help accelerate your scientific innovation by providing solutions that allow you to focus on your work and keep your production line running.

Through our single-use solutions, we can help solve unique problems in all areas of a biopharmaceutical manufacturing operation. Our capabilities in the customer single-use solutions include:

- Tanks & Tank Liners
- Ported Pillow Bags & Bag Mixing Systems
- Bottle Assemblies
- Hose & Tubing Manifolds
- Specialty Connectors
- Standard & Custom Products
- Product Development & Prototyping

EXPERTISE

A COLLABORATIVE APPROACH TO DESIGNING YOUR SOLUTION

Fluid connectivity knowledge delivered through local single-use experts with direct application knowledge

Proven Single-Use expertise in:

- Complete single-use manufacturing facilities
- Traditional stainless steel-based facilities
- Conversion from 'self assembled' items

CHOICE

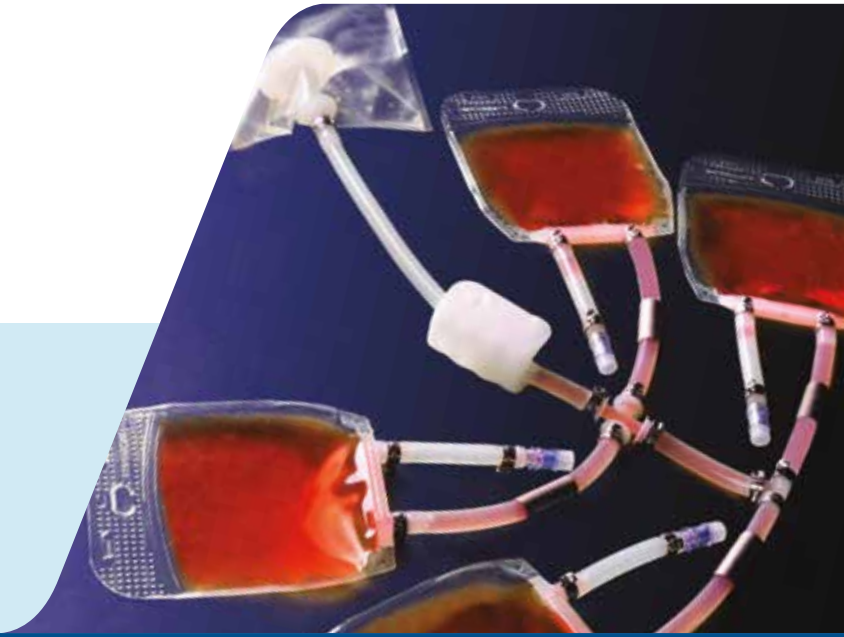
ACCESS TO AN UNMATCHED PRODUCT PORTFOLIO

- Open architecture with components sourced from multiple suppliers
- Unbiased integrator with global reach
- 100+ standard products available to solve many typical bioprocess operations

SERVICES

DESIGNED TO KEEP YOUR PRODUCTION LINE RUNNING

- Expedited design and approval process
- Drawings < 3 days
- Complete validation packs in < 3 days
- Unmatched global logistics and planning



To view our entire single-use offering, please visit **vwr.com/single-use**.

OmniTop Sample Tubes® VWR SINGLE-USE

PAW BioScience VWR Bioprocessing Division

OmniTop Sample Tubes® with OctoCap™

Novel Devices Designed to Simplify Bioprocess Fluid Sampling & Operations

By Tim Korwan and Ben Willemstyn, PAW BioScience Products, LLC

The conical tube is one of the most universally accepted and commonly used products for collecting samples and can be found in virtually any laboratory environment. Bioprocess production requires frequent in-process sampling to confirm product integrity and conformance. To achieve this, an accurate sample must be taken that is a complete representation of the product being manufactured. Contaminates can cause false positives that could lead to poor decisions about product conformance based on these inaccurate results.

The current practice for taking samples using a conical tube is to open the top cap and expose the tube and the product to the outside environment, or to use an isolator or environmentally controlled cabinet while sampling. This exposure of the tube and the open sampling process can lead to product contamination. The use of an isolator, albeit safe, is both time consuming and cost prohibitive. This article will explain how the advancements in conical tube cap design have made OmniTop a critical component in upstream and downstream bioprocess applications, saving both time and money.

Closed System Sampling with a Conical Tube

P AW BioScience developed OmniTop Sample Tubes®, a platform of conical tubes with uniquely designed caps to achieve closed system sampling and fluid transfers. The rigid wall of the conical tube makes an ideal collection and transfer vessel. The standard OmniTop design is a simple ready to use device. By connecting a 50mL Syringe to the 0.2µm vent filter, the operator can easily pull back on the syringe creating a vacuum in the OmniTop forcing the sample to be drawn.

PAW BioScience designed a new generation of caps for the Omnitop product line. The eight sided caps, referred to as OctoCaps™, are one-piece injection molded caps configured to fit various sized conical tube volumes. The simple molded design eliminates the need for far more exotic and expensive closure systems currently being offered by other suppliers. OctoCap™ is designed with two ⅛" hose barb connections to allow for filter and inlet connections.

CAP Design: The Key to Maintaining Functionality and Sterility

The OctoCaps™ were designed using a plug seal that seats itself inside the conical tube opening. The plug seal is achieved by an interference fit of the outside surface of the plug seal feature and the inside surface of the conical tube neck.

Additionally, the cap is designed with an octagonal outer surface feature that allows for the easy use of a torque wrench. During assembly, NIST traceable torque wrenches provide a validatable means to guarantee perfect assembly of each Omnitop Sample Tube® device. Testing has shown that OmniTop with OctoCap™ are leak-proof up to 10psig.

OctoCaps™ are designed to fit both 15mL and 50mL Polypropylene tubes as well as 50mL glass tubes. The glass tube is designed to seal using a flat silicone gasket. Glass conical tubes are used for long term storage of final product for stability testing.

Application 1: OmniTop simplifies Cell Inoculation

Maintaining sterility throughout every step of production is a critical aspect of Bioprocess Production. Any fluid addition to the bioreactor is an opportunity for potential contamination. In order to reduce the risk of contamination good aseptic technique is required and ideally all connections are made in a closed system environment. One of the first steps in a bioprocess production is the cell inoculation. The OmniTop is a perfect vessel for this small volume addition. OmniTops can be sterile connected to the bioreactor with a commonly used tube welder. After connecting a syringe to the 0.2µm filter, air can be driven into the OmniTop which forces fluid into the bioreactor via the dip tube. Because OmniTop is a closed system it has greatly simplified any small volume addition to a bioreactor and is now being used for many upstream Bioprocess applications.

Application 2: Moving Beyond the Isolator for In-Process Sampling

It is common practice in the Biotechnology and Pharmaceutical industries to use isolator or biological safety cabinets to take samples. Isolators are used to separate human manipulation and the potential for contamination from the product being manufactured.

Isolators require continual environmental monitoring and a strict cleaning regimen to maintain sterility. Sampling using an isolator increases the cost of sampling and time consuming to the production timeline.

Again, because OmniTop is a closed system sampling method the sampling method is able to move this very costly and time consuming sampling operation outside of the isolator while still maintaining product and sample integrity with OmniTop.

Application 3: Single Point Connection - Multi-Day Sampling of bulk final product
OmniTops are supplied in custom configurations including multi-tube manifolds. Custom manifolds are designed with any variation of conical tubes to allow the greatest degree of flexibility in sampling design. With a single point connection, daily or multi-day samples can be taken eliminating the risk of making multiple connections to the process.

When taking multi-day samples, it is critically important that the line between your sample site and your vessel not have hold up from the day's previous sample. The holdup volume in this transfer line will not be a representative sample of the process. The OmniTop is designed to have the ability to clean the connection line after a sample is drawn. Once the sample is taken by pulling a vacuum in the OmniTop, the syringe can then be removed and drawn back with air. The syringe will then be used to push air into the OmniTop through the 0.2µm filter to push the remaining fluid in the sample line back to your vessel. Additionally, a waste bottle can be included with the manifold to allow pre-sample flushing.

Summary
OmniTop Sample Tubes® with OctoCaps™ are a convenient BioProcess solution that can be used to obtain fluid samples and perform small volume transfers. OmniTops are available with or without internal dip-tubes to facilitate removal of the fluid inside. OmniTop Sample Tubes® are available in a wide variety of standard configurations or they can be customized to suit your specific applications.

PAW BioScience
VWR Bioprocessing Division

OmniTop Assemblies, Pre-Sterilized Single-Use Sample Tubes, PAW BioScience

OmniTop Sample Tubes are a convenient device that can be used to obtain fluid samples. Each OmniTop tube comes with a pre-attached 0.2µm vent filter and 18" of tubing (C-Flex®, TYGON®, silicone or PharMed®).

- Customizable cap system
- Unique cap design allows for complete customization
- Ability to use different ID and OD tubing diameters
- Wide selection of tubing materials
- Easily configured with virtually any type of tubing
- Single-use
- Cost-effective
- Reduced assembly and installation time
- Eliminate cleaning validation
- Flexible manufacturing
- Design permits quick delivery on small lots
- Closure system can be used with various glass bottles
- Available individually packaged or configured in manifold
- Material: Polypropylene

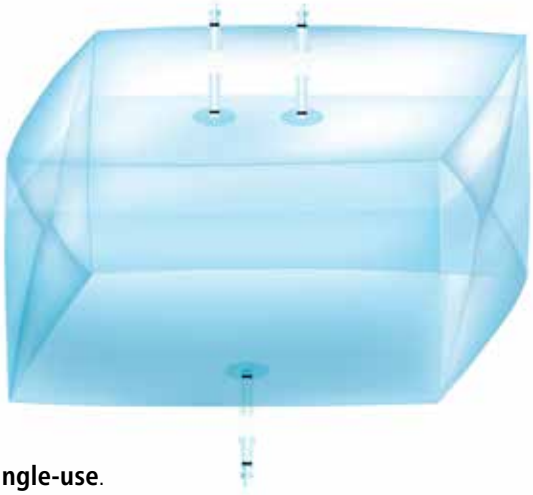
These tubes are available with or without internal dip-tubes to facilitate removal of the fluid inside. OmniTop Sample Tubes are availble in a wide variety of standard configurations or they can be customized to suit your specific applications.

Description	Cat. No.	Pack of 10
15mL OmniTop Standard, PP	**75840-758**	**313.84**
50mL OmniTop Standard, PP	**75840-774**	**313.84**

Shop **vwr.com** for a full listing of products and styles.

BIOCONNECT
VWR SINGLE-USE

JM BioConnect® 3D Cubic Bags



These 3D cubic bags can fit in existing support containers, but also delivered together with a matching version made of plastic or stainless steel. They are available in 200L and 500L volume with 2 ports on top of the bag. Both ports consisting of silicone platinum tubing with MPX-connectors. Made from proprietary JMS Flex Film, they feature a polyethylene inner and outer layer and a high oxygen barrier layer. JMS Flex Film has a high clarity and flexibility, and it is resistant to a wide range of chemicals.

Bags will be delivered gamma irradiated and ready-to-use.

Ordering Information: VWR® is also able to deliver customer-specific 3D Cubic Bags in all volumes up to 3.000 L. For more information about customization, please visit **vwr.com/single-use**.

3D Cubic Bags

Capacity, L (gal.)	Cat. No.	Case of
200 (52.8)	**75876-048**	5/ **997.70**
500 (132.1)	**75876-050**	4/ **953.04**

Support Containers for 3D Cubic Bags

	Capacity, L (gal.)	Cat. No.	Each
Rigid Outer Support Container, Plastic, Cleanroom Version, Foldable	500 (132.1)	**75876-056**	**2658.04**
Rigid Outer Support Container, Plastic, Cleanroom Version, Foldable	200 (52.8)	**75876-052**	**998.14**
Rigid Outer Support Container, Stainless Steel, Cleanroom Version	200 (52.8)	**75876-054**	**2530.00**
Rigid Outer Support Container, Stainless Steel, Cleanroom Version	500 (132.1)	**75876-058**	**2840.20**

PAW BioScience
VWR Bioprocessing Division

SterilEnz®-II/AT: Pre-Gasketed Sanitary Fittings for Single-Use Systems, PAW BioScience

SterilEnz®-II/AT connectors come with a platinum cured, medical grade silicone gasket mechanically attached to the fitting face.

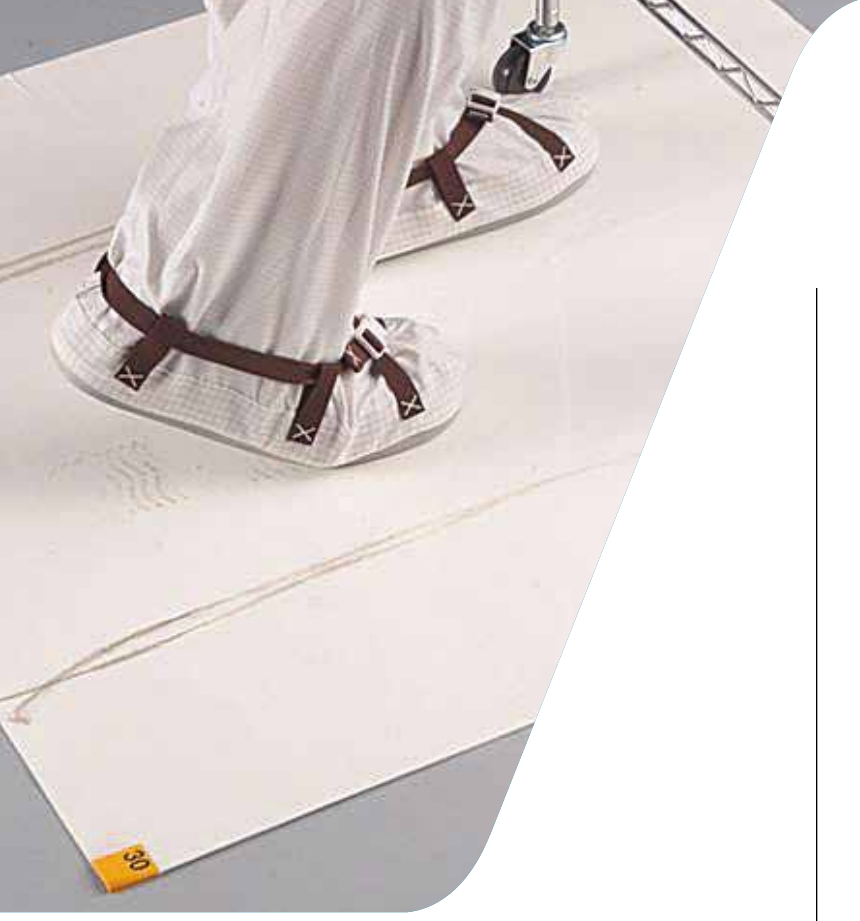
- Standard sanitary clamp fitting, per ASME BPE Specifications
- Class VI Compliant materials; certificate included
- Won't leak or blow-off like stepped barbs can
- Mono-Barb design
- Zero mold parting lines on all critical sealing surfaces
- Superior tooling
- Gamma-stable, 25 - 40 kGY
- For use in irradiated disposable systems
- Autoclaveable at 123°C for 30 minutes
- Certified free from any animal derived components or processes

Fittings are made rugged inert polypropylene suitable for either autoclaving or gamma-irradiation. The new II/AT series is available in seven fitting sizes.

SterilEnz®-II/AT Standard Sanitary Fitting with Gasket

Fitting Size, HB x TC, (in.)	Cat. No.	Pack of 10	Case of 100
¼ x 1	**75838-678**	**99.00**	**792.00**
¼ x Mini	**75838-676**	**99.00**	**792.00**
⅜ x 1	**75838-668**	**99.00**	**792.00**
⅜ x Mini	**75838-680**	**99.00**	**792.00**

Fitting Size, HB x TC, (in.)	Cat. No.	Pack of 10	Case of 100
½ x 1	**75838-672**	**99.00**	**792.00**
½ x Mini	**75838-670**	**99.00**	**792.00**
¾ x 1	**75838-674**	**99.00**	**792.00**



VWR COLLECTION

VWR® PureStep Adhesive Mats

Multi-layered contamination control mats remove and contain dirt and dust from foot traffic and equipment wheels.

- Mats consist of 30 or 60 sheets of 1.5mil low-density polyethylene film
- Each sheet has a 0.3mil thick acrylic-based, pressure-sensitive adhesive coating
- Numbered tabs ensure one-at-a-time sheet removal
- Antimicrobial agent protects against growth of bacteria, mold, and fungus
- Mats can easily be removed during routine floor maintenance

30-Layer High-Tack Mats

L x W, cm (in.)	Cat. No.	Case of
White		
91.4 x 45.7 (36 x 18)	**89131-500**	8/ **199.72**
152.4 x 91.4 (60 x 36)	**89089-166**	4/ **385.25**
Blue		
91.4 x 61 (36 x 24)	**82031-676**	4/ **236.68**
114.3 x 45.7 (45 x 18)	**87004-296**	8/ **257.18**
114.3 x 66 (45 x 26)	**82028-392**	8/ **307.39**
114.3 x 91.4 (45 x 36)	**82029-678**	8/ **381.61**
152.4 x 91.4 (60 x 36)	**89066-232**	4/ **387.18**

For a full line of adhesive mats, shop **vwr.com**.

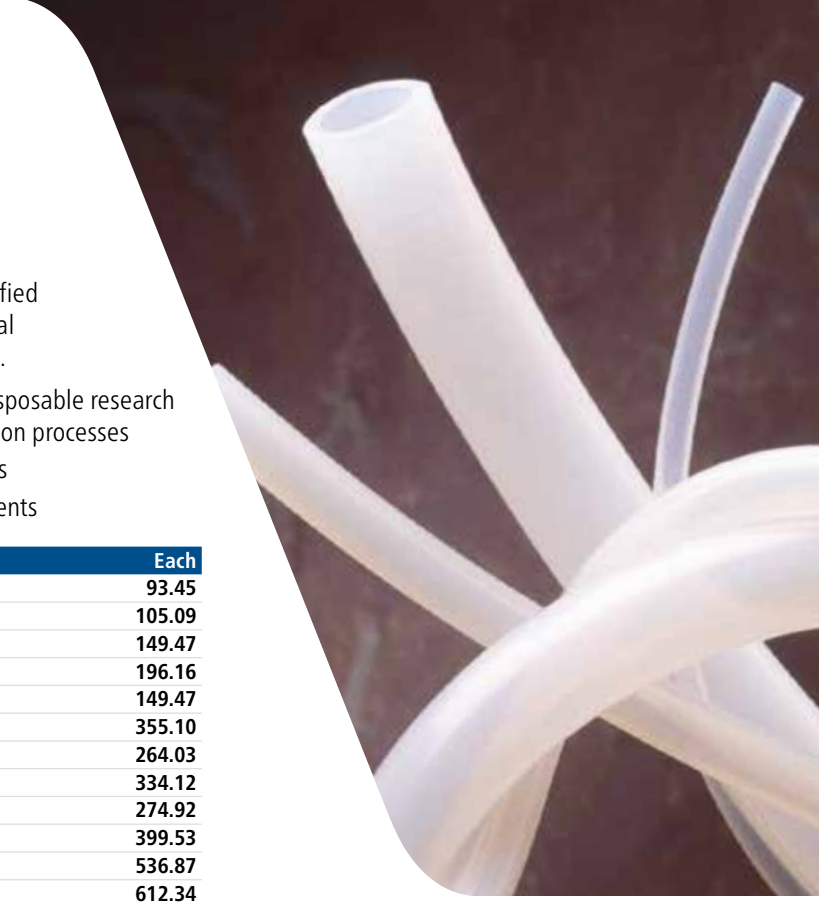
VWR COLLECTION

VWR® Carboy with Sanitary Neck

- Ideal for bioprocessing applications
- Convenient shoulder handles

Instead of a threaded closure system, carboys feature a 76mm (3") sanitary flange that accepts standard TC fittings. Meets USP-VI criteria & US FDA.

Capacity, L	Cat. No.	Each	Case of
10	**75795-692**	**225.00**	6/ **1147.50**
20	**75795-678**	**282.60**	4/ **1017.36**
50	**75795-684**	**376.20**	—



VWR® Silicone Tubing

Low-volatile grade, platinum-cured silicone tubing is produced in a certified ISO Class 6 (FED-STD-209E Class 1000/M4.5) cleanroom for use in critical pharmaceutical, biomedical, laboratory, food, and cosmetic applications.

- Non-contaminating
- Extremely flexible
- Resistant to temperature changes
- Chemically resistant
- Ideally suited for single use/disposable research and development and production processes
- Supplied in 15.2m (50') lengths
- Free of animal-derived ingredients

I.D. x O.D. (in.)	Wall Thickness (in.)	Cat. No.	Each
0.062 x 0.125	0.032	**89068-468**	**93.45**
0.125 x 0.250	0.063	**89068-474**	**105.09**
0.188 x 0.313	0.063	**89068-478**	**149.47**
0.188 x 0.375	0.094	**89068-480**	**196.16**
0.250 x 0.375	0.063	**89068-482**	**149.47**
0.250 x 0.500	0.125	**89068-484**	**355.10**
0.313 x 0.500	0.094	**89068-488**	**264.03**
0.375 x 0.500	0.063	**89068-456**	**334.12**
0.375 x 0.625	0.125	**89068-490**	**274.92**
0.500 x 0.688	0.094	**89068-460**	**399.53**
0.500 x 0.750	0.125	**89068-492**	**536.87**
0.625 x 0.875	0.125	**89068-494**	**612.34**

Shop **vwr.com** for additional sizes.

VWR® Sterile Sample Bags

These sample bags are ideal for transportation and storage of solids, semisolids, and liquids for environmental and carcass sampling, biomedical and pharmaceutical research, quality assurance procedures, food industry applications, and clinical and veterinary medicine.

- Sterile
- Pliant polyethylene sterile tubing
- Highly resistant
- Wire closure for an airtight seal
- Wide-sealed bottoms for leakproof protection

Bags are made of pliant, highly resistant virgin polyethylene sterile tubing with no side seals. They feature a wire closure for an airtight seal, and wide-sealed bottoms for added leakproof protection. To use, tear off perforated top, pull tabs to open bag, fill, grab ends of tape closure and pull shut, twirl bag three or four times to seal, and bend ends of closure inward to lock the seal.

W x H, cm (in.)	Capacity, mL (oz.)	Thickness, mil	Cat. No.	Pack of	Case of 1000
Round Wire Bags					
11.4 x 22.9 (4½ x 9)	450 (15)	2.5	**82007-694**	500/ **145.62**	**253.01**
14 x 22.9 (5½ x 9)	650 (22)	3	**82007-698**	500/ **157.56**	**273.64**
11.4 x 30.5 (4½ x 12)	900 (30)	2.5	**82007-696**	500/ **169.74**	**295.65**
14 x 38.1 (5½ x 15)	1500 (50)	3	**82007-700**	500/ **225.02**	**392.18**
17.8 x 30.5 (7 x 12)	1650 (55)	3	**82007-728**	250/ **116.45**	**408.56**
Round Wire Bags with White Marking Area					
11.4 x 22.9 (4½ x 9)	450 (15)	2.5	**82007-706**	500/ **172.94**	**289.53**
14 x 22.9 (5½ x 9)	650 (22)	3	**82007-708**	500/ **208.83**	**349.63**
17.8 x 30.5 (7 x 12)	1650 (55)	**3**	**82007-726**	250/ **131.52**	**457.70**

Shop **vwr.com** for additional sizes and varieties.

VWR® COLLECTION

VWR® Spec-Wipe® 3 and Spec-Wipe® 3e Wipers

- 45% polyester and 55% cellulose (3)
- 46% polyester and 54% cellulose (3e)
- For use in critical environments
- Low extractables
- Creped fabric
- Hydroentangled blends produce durable wipers that pick up liquids quickly

These nonwoven wipers are suitable for use in critical environments, for absorbing spills of water and most common solvents, and for tasks such as cleaning laminar flow benches.

Low extractables and metallic ions make these wipers good for use where chemical purity is of prime importance.

W x L, cm (in.)	Cat. No.	Pack of	Case of
Spec-Wipe 3			
22.9 x 22.9 (9 x 9)	**21914-758**	300/ **47.24**	6000/ **772.70**
30.5 x 30.5 (12 x 12)	**21912-042**	150/ **49.33**	3000/ **740.94**
Spec-Wipe 3e			
22.9 x 22.9 (9 x 9)	**89065-956**	300/ **34.98**	6000/ **488.50**
30.5 x 30.5 (12 x 12)	**89065-958**	150/ **34.98**	3000/ **488.50**

Secure & Protect

Metro® Security Storage

Protect valuable materials and sensitive items from loss or pilferage

- Security Units are available in multiple sizes and finishes, in both stationary and mobile options.
- For use any where in your facility where security is needed — Lab, Clean Room, Cooler and Stock Room
- Heavy-gauge open wire construction keeps contents visible at all times, and facilitates air flow
- Add optional Intermediate Shelves to base models, allowing flexibility to meet changing needs. Can be positioned in 1" (25mm) increments along the entire height of post.
- Double Doors open 270° and can be secured along the sides of the unit.
- Shipped knocked-down saves freight costs. Easy assembly.

1. Select the Finish
2. Choose Stationary or Mobile
3. Add Intermediate Shelves

METRO®

Dry Environments		Wet Environments					
Super Erecta® Chrome Finish	Cat. No.	Super Erecta Metroseal 3™ Finish Corrosion Resistant	Cat. No.	MetroMax Q® Polymer & Epoxy Coated Steel Finish Corrosion Resistant	Cat. No.	Super Erecta Type 304 Stainless Steel Finish Corrosion Proof	Cat. No.
	82023-456		**82023-460**		**22233-690**		**82023-464**
	82023-472		**82023-476**		**22233-692**		**82023-480**
	82023-422		**82023-428**		**22233-694**		**89369-978**
	82023-424		**82023-430**				**89369-982**
	82023-426		**82023-432**				**89369-988**

For more styles and information, please visit **vwr.com**

VWR® COLLECTION

VWR® Pocket Mop Cleanroom Mops

The Pocket Mop is a flat head mop that can be used for controlled environments, and is economical enough to compete with commercial mops that are often used in support or non-classified areas.

- Suited to pharmaceutical production, compounding pharmacies, food processing, nutraceuticals, hospitals and medical device
- Cleanroom grade materials of construction
- Lightweight, ergonomic hardware
- Angled head for easy application of disinfectant or detergent
- Available in NovaPoly, PolySorb, Microfiber and MegaTex materials
- Launderable/Autoclavable mop heads
- Available Irradiated

PocketMops are economical enough for single use but can be laundered and reused. Compatible with alcohol, strong disinfectants and steam sterilization.

Used with the QPSL-14 or QPSL-18 adapter, the mop is lightweight and easy to maneuver. The swivel joint rotates 360° but can be locked in a 180° movement for more precise, controlled cleaning.

Available in two standard sizes, 14" and 18", the PocketMop is available in a number of different fabrics.

PolySorb: A textured polyester – available with or without urethane foam interior

MegaTex: A non-woven, textured polyester blend with abrasive properties

NovaPoly: 100% Polyester – with urethane interior or microfiber interior

Microfiber: For dry and wet mopping and for glass and high-gloss surfaces. Available with or without urethane foam interior.

Description	Cat. No.	Pack of 4	Case of 24
14" PolySorb	10029-718	44.52	242.97
14" PolySorb IR	10029-720	—	367.27
14" PolySorb, No Foam	10029-722	37.63	225.60
18" PolySorb	10029-724	45.23	271.20
18" PolySorb IR	10029-726	—	395.47
18" PolySorb, No Foam	10029-728	46.16	251.91
14" MegaTex	10029-730	43.71	243.44
14" MegaTex IR	10029-732	—	367.00
18" MegaTex	10029-734	44.27	265.43
18" MegaTex IR	10029-736	—	395.21
14" NovaPoly	10029-738	36.77	220.46
14" NovaPoly IR	10029-740	—	344.70
18" NovaPoly	10029-742	40.70	244.00
18" NovaPoly IR	10029-744	—	367.75
14" Microfiber	10029-750	43.71	243.44
14" Microfiber IR	10029-752	—	367.00
14" Microfiber, No Foam	10029-754	36.98	221.83
18" Microfiber	10029-756	43.13	258.76
18" Microfiber, No Foam	10029-758	41.22	247.34
18" Microfiber, No Foam, IR	10029-760	—	368.95
14" White Microfiber	10029-762	43.71	243.44
14" White Microfiber IR	10029-764	—	367.27
18" White Microfiber	10029-766	45.23	271.20
18" White Microfiber IR	10029-768	—	395.47

GIBRALTAR LABORATORIES

SteriKit® Vials, Stoppers, and Seals, Sterile, Gibraltar Laboratories

Kit consists of ready to use vials, seals, and stoppers. All components are certified in a cGMP laboratories to be USP 85 pyrogen-free, USP 788 particulate-free and USP 71 sterile. A certificate is available with each order.

- Completely customizable
- Available with vial sizes ranging from 2–20mL
- Double vacuum packaged under sterile ISO 5 conditions
- Disposable packaging is easy to use
- Color: clear

The vials are type I borosilicate glass and are USP WFI washed, aseptically repackaged in a 316 stainless steel tray, and USP dry heat depyrogenated in an ISO 7 cGMP cleanroom. The stoppers and seals are USP WFI washed, aseptically repackaged, and cGMP moist heat steam sterilized. Following sterilization, all components are assembled, vacuum packed, and heat sealed in a pre-sterilized LDPE bag under ISO 5 conditions.

Capacity, mL	Size	Packaging	Cat. No.	Case of 6
2	13 mm Stopper; 13 mm Seal	278 Vials/Kit	**75805-150**	**8653.05**
3	13 mm Stopper; 13 mm Seal	224 Vials/Kit	**75805-152**	**7673.40**
5	20 mm Stopper; 20 mm Seal	120 Vials/Kit	**75805-154**	**6465.90**
10	20 mm Stopper; 20 mm Seal	104 Vials/Kit	**75805-156**	**6249.60**
20	20 mm Stopper; 20 mm Seal	66 Vials/Kit	**75805-158**	**5688.90**

Shop **vwr.com** for the full line of products.

VWR® COLLECTION

VWR® Sterile Polycarbonate Single-Use Bottle Assemblies

Sterile polycarbonate containers with weldable tubing provide the maximum amount of flexibility and reliability.

- Sterile bottles come individually bagged and process ready
- Multiple bottle sizes allow for process-specific flexibility
- Gamma irradiated to Sterility Assurance Level (SAL) 10^{-6}
- Tubing Material: C-Flex
- Assembled in an ISO Class 7 cleanroom and are manufactured from USP Class VI materials
- They are offered in a comprehensive size selection with tubing that is completely weldable/sealable
- When used with sterile VWR® tube sets, custom possibilities are endless

Capacity, mL (oz.)	Tubing Length	Tubing Connection: Cap Size	Tubing Connection	Tubing Size	Cat No.	Pack of	Case of
125 (4)	Port 1: 24" Port 2: 3"	38-430	Port 1: PP Tube Plug Port 2: 25mm PES Vent Filter	Port 1: ⅛ x ¼" Port 2: ⅛ x ¼"	**10830-302**	6/ **954.47**	24/ **3230.50**
250 (8)	Port 1: 24" Port 2: 3"	38-430	Port 1: PP Tube Plug Port 2: 25mm PES Vent Filter	Port 1: ⅛ x ¼" Port 2: ⅛ x ¼"	**10830-304**	6/ **972.17**	24/ **3290.43**
500 (16)	Port 1: 24" Port 2: 3"	38-430	Port 1: PP Tube Plug Port 2: 25mm PES Vent Filter	Port 1: ⅛ x ¼" Port 2: ⅛ x ¼"	**10830-306**	6/ **985.39**	24/ **3335.16**
1000 (32)	Port 1: 24" Port 2: 3"	38-430	Port 1: PP Tube Plug Port 2: 25mm PES Vent Filter	Port 1: ⅛ x ¼" Port 2: ⅛ x ¼"	**10830-696**	3/ **516.48**	12/ **1748.05**
2000 (64)	Port 1: 12" Port 2: 3" Port 3: 12"	53B	Port 1: PP Tube Plug Port 2: 50mm PTFE Vent Filter Port 3: PP Tube Plug	Port 1: ⅜ x ½" Port 2: ¼ x ⅜" Port 3: ⅜ x ½"	**10830-698**	2/ **618.46**	12/ **3095.60**

CONTEC

PREempt™ RTU Disinfectant Solution and Wipes

PREempt RTU Disinfectant Solution and Wipes work to ensure user, protocol and product compliance with fast contact times and broad-spectrum efficacy. PREempt RTU utilizes AHP®, a patented synergistic blend of commonly used, safe ingredients that when combined with low levels of hydrogen peroxide dramatically increase its potency and cleaning performance. It has a 1 minute bactericidal and virucidal, 5 minute tuberculocidal, 10 minute fungicidal, and 30 seconds broad-spectrum sanitizing claim.

PREempt RTU products are ideal for daily cleaning and disinfecting environmental surfaces in cleanrooms and laboratory areas including work stations, fume hoods, equipment and other hard non-porous environmental surfaces.

US ONLY

Size	Packaging	Cat. No.	Case of
PREempt RTU Ready to Use Disinfectant			
32 oz. bottle (0.9 L)	12 bottles/case	**10822-516**	12/ **102.60**
1 gallon (3.8 L)	4 gallons/case	**10822-518**	4/ **111.78**
5 gallon (19 L)	1 gallon/case	**10822-454**	1/ **114.00**
PREempt RTU Disinfectant Wipes, Meltblown Polypropylene			
6" x 7" (15.2 x 17.8cm)	160 wipes/canister; 12 canisters/case	**10822-456**	12/ **224.58**

These specific products are not available in Canada. Please contact your VWR Sales Representative to learn about easy access to similar options available in your region.

CONTEC

PeridoxRTU® Sporicidal Disinfectant and Cleaner

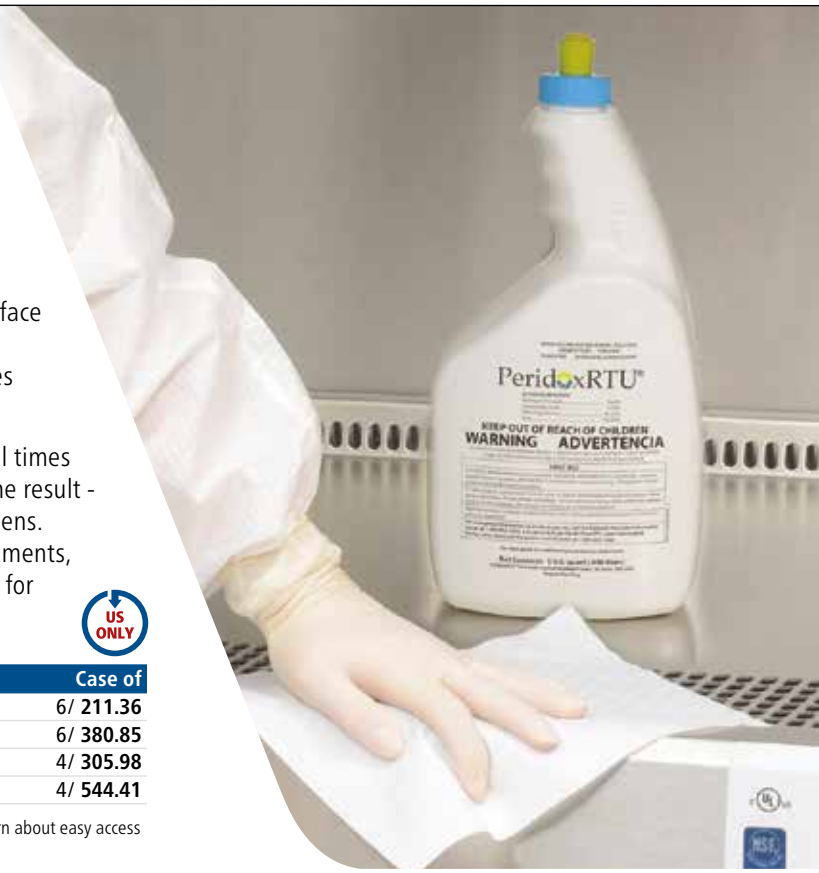
PeridoxRTU is a broad spectrum, EPA-registered sporicide, bactericide, virucide, tuberculocide and fungicide one-step disinfectant and hard surface cleaner. It is effective against bacterial spores in 3 minutes. PeridoxRTU contains no alcohol or bleach and, unlike most other disinfectants, leaves minimal residue on surfaces.

Patented, hyperactive chemistry provides fast results. With its shorter kill times and powerful wetting agents, PeridoxRTU stays wet and works faster. The result - assured efficacy against hard-to-kill spores and other dangerous pathogens. For disinfecting in the most critical of cleanrooms and controlled environments, PeridoxRTU is available validated sterile to 10^{-6} SAL. PeridoxRTU is ideal for terminal cleaning.

US ONLY

Size	Cat. No.	Case of
32 oz. bottle	**10032-834**	6/ **211.36**
32 oz. bottle, sterile	**10148-324**	6/ **380.85**
1 gallon	**10032-832**	4/ **305.98**
1 gallon, sterile	**10746-534**	4/ **544.41**

These specific products are not available in Canada. Please contact your VWR Sales Representative to learn about easy access to similar options available in your region.



HARDY DIAGNOSTICS
A Culture of Service™

Three heads are better than one

TRIO.BAS™ TRIO Air Samplers with Bluetooth

From the creators of the industry standard Surface Air System (SAS), the future of environmental impact air sampling is here: the ORUM TRIO.BAS™ system. The power of three aspirating heads is now available through VWR by Hardy Diagnostics, your exclusive North American distributor of ORUM TRIO.BAS.

- Bluetooth application for transferring data to PC or printer
- 3 aspirating heads with the ability to sample before, during, or after operations
- Collect samples on 3 different culture media plates or collect air on separate plates of the same medium
- Aspirating head with quick bayonet closing system for easy manipulation
- Available in 100 or 200 L/Min. flow rate models
- Manual or automatic functions, with cascade password capability
- Ergonomic and balanced design
- No plugs or external connections
- Connection-free induction battery charger provides up to 15 hours of service
- Programmable for simultaneous or interval operation, with delayed & remote start capabilities

For pricing and more information, please visit **vwr.com**

75804-730

VWR® COLLECTION

VWR® Angled Foam Wall Mop

Wedge-shaped mop head is made of knitted polyester fabric laminated to clean ester foam for excellent abrasion resistance.

- Fully autoclavable
- Stainless steel swivel-head frame

Ideal for cleaning ceilings and walls, and for applying disinfectants and cleaning solvents in controlled environments. Large size allows efficient coverage of large areas, while wide leading edge and angled sides allow easy access to tight corners. Compatible with a wide range of chemicals. Autoclavable at 121°C (250°F) for 30 minutes. Suitable for ISO Class 5 (FED-STD-209D Class 100/M3.5) conditions. Fits a 30.5 cm (12") frame (not included).

Description	Cat. No.	Case of 28
Mop Head, 35.6 cm (14")	**89012-766**	**517.53**

S-Curve Technologies, Inc®

Dispensers for Controlled Environments

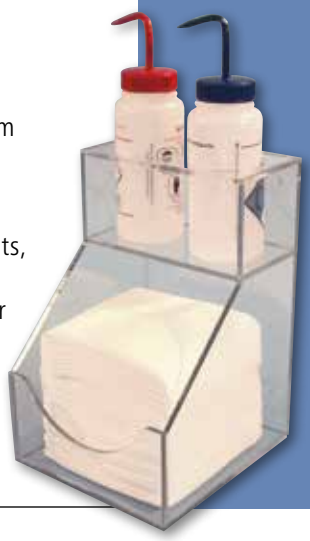
For Use in Cleanrooms, Laboratories, and Safety Applications

- Designed to protect the cleanroom supplies from contamination
- Provide "ease-of-access" for the cleanroom workers
- Maximize space utilization for supplies in the production gowning room
- Available with wall mount brackets

Cleanroom Dispensers for Every Need:
Apparel, Beard Covers, Booties, Bottles, Bouffants, Coveralls, Documents, Ear Plugs, Face Masks, Finger Cots, Frocks, Gloves, Hairnets, Safety Glasses, Shoe Covers, Smocks, Tissues, Wipers, and Custom designs for specific requirements.

To see our full line of products, visit **vwr.com** and enter 'S-Curve Technologies' in the search bar.

98106-922
Glove Dispensers



10027-878
Wiper Dispensers

10703-476
Safety Goggle Dispensers

VWR® COLLECTION

VWR® Sterile 70% Isopropanol

Filtered to 0.2µ and induction sealed to assure sterility.
Each bottle is lot coded and has an expiration date.
Excellent for wipedown of isolators, cabinets, laminar flow hoods.
Suitable for wipedown of products and equipment for pass through to controlled environments. Can be used on gloved hands in sterile environments.

- Contains 70% USP grade isopropanol and 30% USP grade deionized water
- Double-bagged and gamma-irradiated to SAL 10^{-6}
- Ideal for use with sterile cleanroom wipers
- USP-compliant

Description	Size	Cat. No.	Case of
Bottle	3.8 L (1 gal.)	**89108-162**	4/ **217.17**
Trigger Spray	946 mL (32 oz.)	**89499-420**	4/ **175.08**
Trigger Spray Bottle	473 mL (16 oz.)	**89108-160**	12/ **161.60**

Perfex TruCLEAN® Mopping Systems

TruCLEAN Mopping Systems work to capture and isolate contaminants, ensuring the delivery of unadulterated cleaning and sanitizing agents. TruCLEAN Disinfection systems are designed for fast, easy application of sterilants to floors, walls and ceilings. TruCLEAN components are constructed with high-grade stainless steel, entirely autoclavable, easy to maintain and guaranteed to deliver reliable cleaning results time after time.

- Compatible with gamma, ETO and autoclave sterilization
- Reduce the risk of cross-contamination
- Multiple color combinations available

Color	Cat. No.	Each
TruCLEAN Triple Bucket Mopping System*		
Red	**22940-012**	**2002.79**
White	**22940-015**	**1941.90**
Blue	**22940-014**	**2003.00**
TruCLEAN II		
Red	**89095-990**	**580.55**
Blue	**89095-992**	**580.55**

*Also available in green and yellow

TruCLEAN® Mops and Accessories

Designed for cleanrooms or sterile environments where contamination control is extremely critical. Low profile, stainless steel mop frame compatible with all TruCLEAN mops. Easily change mop heads with our quick squeeze release and frame-locking mechanism. Choose between our polymer adjustable handle and fixed length stainless steel handle. All TruCLEAN mops can be repeatedly laundered providing exceptional value.

- Excellent chemical and microbial resistance
- Low particle generation, excellent surface coherence
- Ideal for disinfection and sterilization procedures

Description	Cat. No.	Case of
TruCLEAN Clean Room Mop	**89096-038**	12/ **268.78**
TruCLEAN Microfiber Mop	**89096-040**	12/ **179.07**
TruCLEAN Anti-Microbial Mop	**89096-036**	12/ **211.98**
TruCLEAN Sponge Mop	**22940-023**	25/ **488.15**
TruCLEAN Mop Cover	**22940-191**	25/ **212.41**

ProductionInsight

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VWR LIFE SCIENCE SERADIGM FB ESSENCE BUNDLE PROMOTION

Get 9 Bottles of FB Essence for the Price of 5!

FB Essence is a nutritionally rich, cost-effective alternative to Fetal Bovine Serum (FBS) containing FBS, Bovine Calf Serum (BCS), Equine Serum, and a proprietary blend of supplements, vitamins, minerals, and growth factors. It is ideal for primary cell lines and is proven effective for suspension, adherent, and "finicky" cell lines. FB Essence offers superior product performance and quality, low endotoxin and hemoglobin levels, and features ISIA certified traceability.

Special Savings! Like getting 4 bottles FREE!

PRODUCT SPECIFICATIONS

- 100 % US origin
- Triple 0.1 µm sterile filtered
- Endotoxin: ≤20 EU/mL
- Hemoglobin: ≤25 mg/dL
- 9 CFR 113.53c Virus, Sterility, Mycoplasma testing
- Biochemical Assay & Electrophoretic Profile
- ISIA certified traceability
- Long term price stability

Process	Size, mL	Cat. No.	Case of 9
None	500	**MP3100-500**	**1181.95**
Heat Inactivated	500	**MP3100-500H**	**1249.65**

*Promotional part numbers are available for a limited time, must be used at the time of purchase, and may be ordered via the "ORDER ENTRY" link on **vwr.com**. (Promotional part numbers cannot be found via Search on **vwr.com**.)
For assistance with ordering, please contact VWR Customer Service at **1.800.932.5000**.

Offer expires 12/31/2017.

VWR Seradigm LIFE SCIENCE

PRODUCT PERFORMANCE AND QUALITY UNLIKE ANY OTHER