5.1.1 Introduction

Today's research and diagnostic laboratories require purified water that does not impact test results. As testing equipment becomes more sensitive and industry regulations become more stringent, life science and analytical labs must have complete confidence that their point-of-use water systems will provide them optimum water quality—every time. Cascada™ Lab Water Systems employ Pall's advanced water purification technologies to achieve the highest purity water through a series of separation and purification steps in a single bench top box. A range of configurations support diverse laboratory needs from critical, sensitive applications to general use.

Cascada systems offer a multitude of benefits including multi-stage monitoring and "real-time" Total Organic Carbon (TOC) monitoring. The systems can be comprehensively and completely sanitized. Each unit's cartridges have complete traceability.

For sensitive applications that require high quality, ultrapure water, choose a customized polishing system:

- Cascada BIO-water System — a polishing system for demanding life sciences applications such as cell culture, in vitro fertilization, and microfluidic and array systems.
- Cascada AN-water System — a polisher for demanding analytical applications such as ultra-trace environmental analysis.

For less demanding applications, choose one of these polishing systems:

- Cascada IX-water System — a polishing system for less demanding lab water applications, including analytical sample preparation.
- Cascada LS-water System — a polisher for general-purpose lab analysis including less sensitive life science applications.

The Cascada RO-water System is a pre-treatment system that protects and extends the life of the polishers. This is particularly important in cases where there is poor feed water quality.

5.1.2 Cascada™ BIO-Water System

The Cascada BIO-water System provides extremely high quality water for life sciences applications by featuring ultrafiltration for the effective removal of contaminants such as endotoxins and nucleases. Endotoxin removal makes the purified water suitable for critical applications in cell culture and monoclonal antibody production. Nuclease elimination removes the requirement for toxic DEPC treatment in applications such as PCR and DNA sequencing. The use of a dual wavelength UV photo-oxidation technology at 185 and 254 nm generates hydroxyl radicals (OH) via ozone and singlet oxygen. The hydroxyl radical has a very high oxidation potential (2.80 volts) and is a key species in the oxidation process of organic molecules. Organic molecules are oxidized to charged organic acids and to CO_2 that combine with water to generate carbonate and bicarbonate ions. All these newly formed ions are retained by mixed ion exchange resins placed downstream from the UV lamp. In addition, these UV-C wavelengths are germicidal, killing bacteria by causing damage to their nuclear DNA, thus preventing cell division.

BIO-water Purification System Flow

Pre-treated water enters the system (for fluid flow diagram, see Figure 5.1) and is pumped through the primary purification pack. The first purification pack removes most of the impurities from the water and the intermediate water quality sensor then measures the resistivity of the water from the first pack to determine when it needs to be replaced. Purified water flows directly through the UV chamber, where it is exposed to intense UV radiation at wavelengths of 254 and 185 nm to provide continuous bacterial control and photo-oxidation of residual organic impurities. The second temperature-compensated quality sensor provides data for TOC monitoring. Any remaining ionic and organic impurities are removed by the second polishing purification pack. The ultrafilter removes pyrogens, bacteria, and other microbial impurities as well as particles. Final water resistivity and temperature are measured before dispensing. Water within the unit is recirculated through the purification system to maintain purity. An intermittent recirculation can be used overnight in 'sleep mode.' An optional 0.2 µm point-of-use (POU) filter is available if required to protect the outlet from bacterial contamination. The specifications of the Cascada BIO-water System are summarized in Table 5.1.

Figure 5.1
Fluid Flow in Cascada BIO-Water System

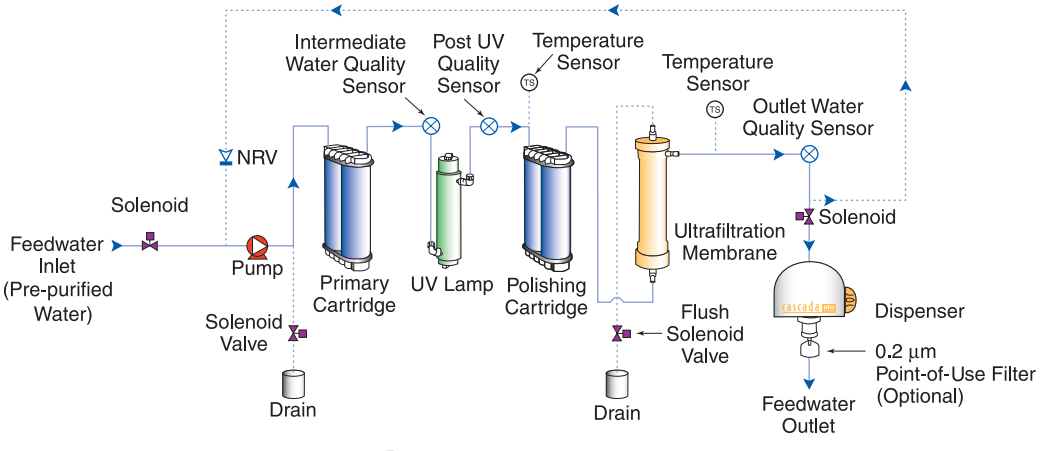


Table 5.1
Specifications of Cascada™ BIO-Water System

Specification	Parameter
Resistivity at 25 °C	18.2 MΩ-cm
TOC (RO Pre-treatment)	< 3 ppb*
Bacteria	< 1 CFU/mL
Bacterial Endotoxin	< 0.001 EU/mL
Particles	Ultrafilter
Flow Rates	Up to 2 L/minute
Dual Purification Cartridges	Yes
Photo-oxidation	185/254 nm UV
0.2 µm Optional POU Filter	Yes
Recirculation	Yes
Interstage Water Purity Monitoring	Yes
Product Water Purity Monitoring	Yes
Real Time TOC Monitoring	Yes

**Dependent on feed water. Recommended feed < 50 ppb TOC.*

Application Data for Cascada BIO-Water System

18.2 Megohm.cm (MΩ-cm) ultrapure water for critical laboratory applications:

- Cell culture
  - — Culture media preparation
- Reagent preparation
  - — Buffers for purification by HPLC
  - — Buffers for dialysis
- Microbiology
  - — Culture media preparation
- Electrophoresis
  - — Running buffer
  - — Silver stain reagents
- Monoclonal antibody production
- Molecular biology
  - — PCR
  - — DNA sequencing
- In vitro fertilization

5.1 – Section 5.1.2

Ordering Information for Cascada™ BIO-Water System

Part Number	Description	Pkg
PAL-CAXXBIOM2	Cascada BIO-water System	1/pkg
PAL-C180	RO Feed (DT) Cartridge Pack	1/pkg
PAL-C181	SDI Feed (DT) Cartridge Pack	1/pkg

5.1.3 Cascada™ AN-Water System

The Cascada AN-water System provides ultrapure water for optimal chromatographic results and longer column life by incorporating UV photo-oxidation technology for oxidation of organic contaminants at 185 nm and 254 nm generating hydroxyl radicals (OH) via ozone and singlet oxygen. The hydroxyl radical has a very high oxidation potential (2.80 volts) and is a key species in the oxidation process of organic molecules. Organic molecules are oxidized to charged organic acids and to CO_2, which combines with water to generate carbonate and bicarbonate ions. All these newly formed ions are retained by mixed ion exchange resins placed downstream from the UV lamp. In addition, these UV-C wavelengths are germicidal, killing bacteria by causing damage to their nuclear DNA, thus preventing cell division. The ultra-microfiltration filter removes colloids and bacteria. The final purified water has extremely low levels of inorganic and organic contaminants for the most demanding high-performance liquid chromatography (HPLC), gas chromatography mass spectrometry (GC-MS), ion chromatography, solid phase extraction, and other UV spectrometry applications.

AN-water Purification System Flow

Pre-treated water enters the system (for fluid flow, see Figure 5.2) and is pumped through the primary purification pack. The first purification pack removes most of the impurities from the water and the intermediate water quality sensor then measures the resistivity of the water from the first pack to determine when it needs to be replaced. Purified water flows directly through the UV chamber where it is exposed to intense UV radiation at wavelengths of 254 and 185 nm to provide continuous bacterial control and photo-oxidation of residual organic impurities. The second temperature-compensated quality sensor provides data for TOC monitoring. Any remaining ionic and organic impurities are removed by the second polishing purification pack. The 0.05 µm ultra-microfilter removes bacterial impurities as well as particles. Final water resistivity and temperature are measured before dispensing. Water within the unit is re-circulated through the purification system to maintain purity. An intermittent recirculation can be used overnight in 'sleep mode.' An optional 0.2 µm point-of-use (POU) filter is available if required to protect the outlet from bacterial contamination. The specifications of the Cascada AN-water System are summarized in Table 5.2.

Figure 5.2
Fluid Flow in Cascada AN-Water System

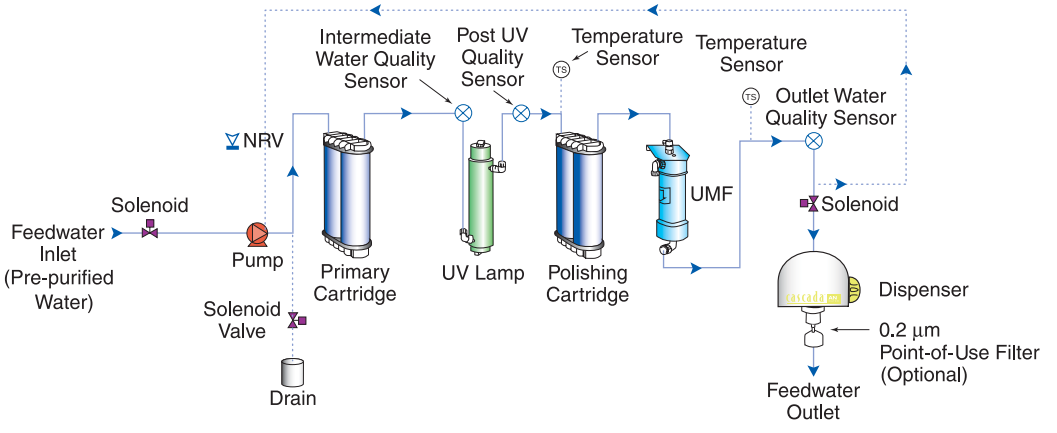


Table 5.2
Specifications of Cascada™ AN-Water System

Specification	Parameter
Resistivity at 25 °C	18.2 MΩ-cm
TOC (RO Pre-treatment)	< 2 ppb*
Bacteria	< 1 CFU/mL
Particles	0.05 µm ultra-microfilter
Flow Rates	Up to 2 L/minute
Dual Purification Cartridges	Yes
Photo-oxidation	185/254 nm UV
0.2 µm Optional POU Filter	Yes
Recirculation	Yes
Interstage Water Purity Monitoring	Yes
Product Water Purity Monitoring	Yes
Real Time TOC Monitoring	Yes

**Dependent on feed water. Recommended feed < 50 ppb TOC.*

Application Data for Cascada AN-Water System

18.2 Megohm.cm (MΩ-cm) ultrapure water for critical laboratory applications:

- Ultra-trace and trace inorganic and organic analysis
- HPLC
- GC-MS
- ICP-MS
- CF-AAS
- TOC analysis
- Ion chromatography
- Solid phase extraction
- Electrochemistry

Ordering Information for Cascada™ AN-Water System

Part Number	Description	Pkg
PAL-CAXXXANM2	Cascada AN-water System	1/pkg
PAL-C180	RO Feed (DT) Cartridge Pack	1/pkg
PAL-C181	SDI Feed (DT) Cartridge Pack	1/pkg

5.1.4 Cascada™ IX-Water System

Pre-treated water enters (for fluid flow diagram, see Figure 5.3) via an inlet solenoid and is then pumped through the polishing purification pack and temperature and water quality sensors before being dispensed or re-circulated through a non-return valve back to the pump inlet. Ionic and organic impurities are removed by the polishing purification pack. Product water resistivity and temperature are measured before dispensing and will indicate when the purification pack needs to be replaced. The water within the unit is recirculated through the purification unit to maintain purity. To reduce heat build up, the recirculation is at a reduced flow rate and is set to be intermittent (5 minutes every hour). A point-of-use filter is required to protect the outlet from bacterial contamination. The specifications of the Cascada IX-water System are summarized in Table 5.3.

Figure 5.3
Fluid Flow in Cascada IX-Water System

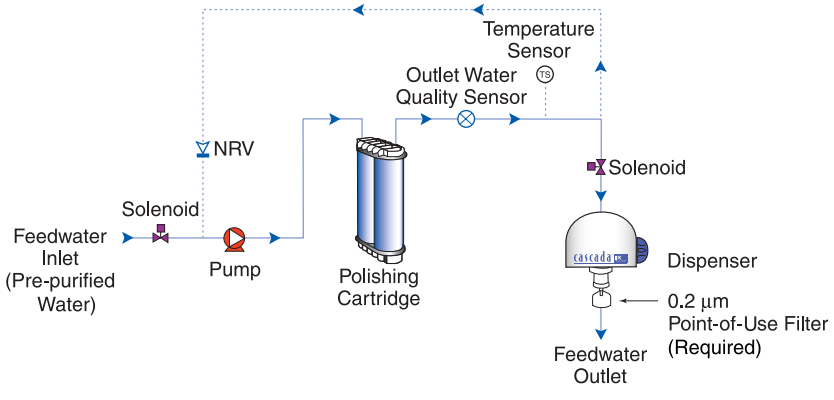


Table 5.3
Specifications of Cascada™ IX-Water System

Specification	Parameter
Resistivity at 25 °C	18.2 MΩ-cm
TOC (RO Pre-treatment)	< 15 ppb*
Bacteria	< 1 CFU/mL
Particles	0.2 µm Point-of-use filter
Flow Rates	1.5 L/minute
Single Purification Cartridge Pack	Yes
Photo-oxidation	No
0.2 µm POU Filter	Required
Recirculation	Yes
Product Water Temperature Monitoring	Yes
Product Water Purity Monitoring	Yes
Consumable Change Reminders	Yes

**Dependent on feed water. Recommended feed < 50 ppb TOC.*

Application Data for Cascada IX-Water System

Designed for general laboratory applications. Removes ionic and organic contaminants to trace levels. Use the 0.2 µm point-of-use (POU) filter for removal of bacteria and particles greater than 0.2 µm.

Ordering Information for Cascada IX-Water System

Part Number	Description	Pkg
PAL-CAXXXIXM2	Cascada IX-water system	1/pkg
PAL-C195	Purification (DT) Cartridge Pack	1/pkg
PAL-C167	Point-of-Use Filter	1/pkg

5.1.5 Cascada™ LS-Water System

Pre-treated water enters (for fluid flow diagram, see Figure 5.4) via an inlet solenoid and is then pumped through the UV chamber, a polishing purification pack, an ultra-filter, and temperature and water quality sensors before being dispensed or re-circulated through a non-return valve back to the pump inlet.

Purified water flows directly through the UV chamber where it is exposed to intense UV radiation at wavelengths of 254 nm and 185 nm to provide continuous bacterial control and the photo-oxidation of residual organic impurities. Ionic and organic impurities are removed by the polishing purification pack. The ultra-filter removes pyrogens, bacteria, and other microbial impurities as well as particles.

Product water resistivity and temperature are measured before dispense and will indicate when the purification pack needs to be replaced. The water within the unit is recirculated through the purification units to maintain purity. To reduce heat build up, the recirculation is at a reduced flow rate and is set to be intermittent (5 minutes every hour). The specifications of the Cascada LS-water System are summarized in Table 5.4.

Figure 5.4
Fluid Flow in Cascada LS-Water System

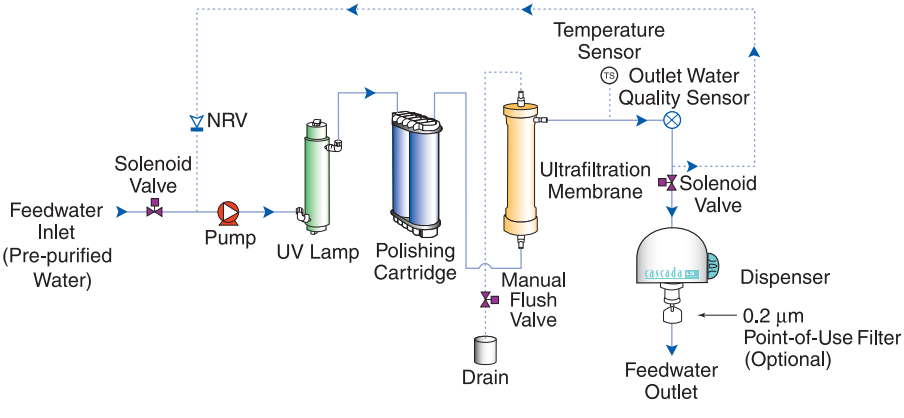


Table 5.4
Specifications of Cascada™ LS-Water System

Specification	Parameter
Resistivity at 25 °C	18.2 MΩ-cm
TOC (RO Pre-treatment)	< 3 ppb*
Bacteria	< 1 CFU/mL
Endotoxin	< 0.005 EU/mL
Particles	Ultrafilter
Flow Rates	1.2 L/minute
Single Purification Cartridge Pack	Yes
Photo-oxidation	185/254 nm UV
0.2 µm POU Filter	Optional
Recirculation	Yes
Product Water Temperature Monitoring	Yes
Product Water Purity Monitoring	Yes
Consumable Change Reminders	Yes

**Dependent on feed water. Recommended feed < 50 ppb TOC.*

Application Data for Cascada LS-Water System

18.2 Megohm/cm (MΩ-cm) ultrapure water for critical laboratory applications:

- ELISA tests
- Affinity chromatography
- Electrophoresis
- Media preparation
- Nucleic acid and protein isolation
- Monoclonal antibody production
- Mass spectrometry

Ordering Information for Cascada LS-Water System

Part Number	Description	Pkg
PAL-CAXXXLSM2	Cascada LS-water System	1/pkg
PAL-C195	Purification (DT) Cartridge Pack	1/pkg
PAL-C167	Point-of-Use Filter	1/pkg

5.1.6 Cascada™ RO-Water System

Potable water enters through a strainer (for fluid flow diagram, see Figure 5.5) and passes through the pre-treatment cartridge. The pre-treatment cartridge has been designed to protect the reverse osmosis cartridges from particulate/colloidal matter and excessive free chlorine that may be present in the incoming feed water. The water passes the sanitization port and moves through two reverse osmosis cartridges, set up in series, which split the flow into permeate and concentrate streams. The concentrate from cartridge 1 is cycled to the inlet of cartridge 2. The resulting permeate streams are combined and pass through the water quality sensor, which measures the conductivity of the water, and the temperature sensor, which provides accurate temperature measurement. The final concentrate from cartridge 2 is passed to waste.

The resulting purified water is delivered to a treated water reservoir where water quality is maintained at the highest levels, using a built-in, automated auto-rinse cycle. This cycle is performed each time the process is initiated and consists of a 1 minute high flow rinse across the RO cartridges to the drain. The specifications of the Cascada RO-water System are summarized in Table 5.5.

Figure 5.5
Fluid Flow in Cascada RO-Water System

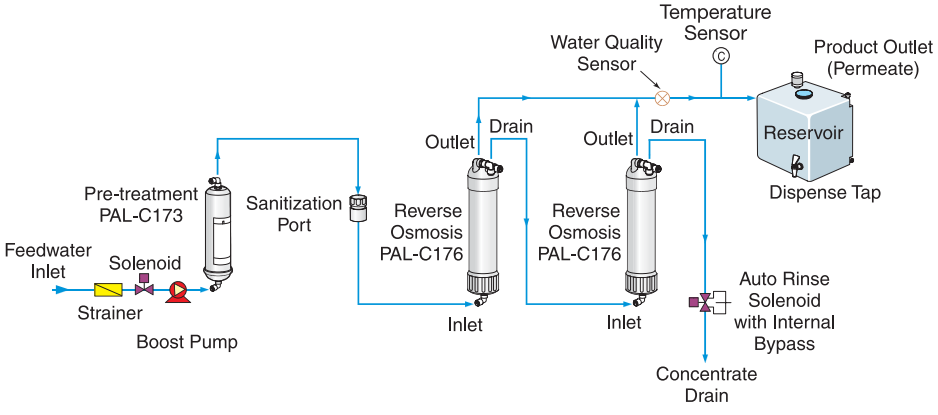


Table 5.5
Specifications of Cascada™ RO-Water System

Specification	Parameter
Inorganics – Typical	Up to 98% rejection
Organics (MW > 100 Dalton)	> 99% rejection
Total Organic Carbon (TOC) – Typical (Dependent on Feed Water)	< 0.1 ppm
Bacteria	< 5 CFU/mL
Particles	> 99% rejection
Flow Rates	15 L/hour
Power Fail-Safe	Yes
Automatic Level Controls	Yes
Audiovisual Alarm Settings	Yes - selectable
Auto-restart	Yes
RO Permeate Purity Monitoring	Yes in µS/cm
RO Permeate Temperature Monitoring	Yes in °C
Reservoir Level Monitoring	Yes % full
Consumable Remaining Life Indicator	Yes

Application Data for Cascada RO-Water System

- Generation of Type III primary-grade water from a potable tap feed to supply other ultrapure water purification systems
- Routine glassware washing
- Hydroponics
- Feed water for humidifiers and autoclaves
- Use in environmental cabinets and stills
- Steam generators

5.1 – Section 5.1.6

Ordering Information for Cascada™ RO-Water System

Part Number	Description	Pkg
PAL-CAXXXROM2	Cascada RO-water System	1/pkg
PAL-A653	Docking Vessel-35 liter	1/pkg

Optional accessories to complement the Cascada RO-water System include printer kit, boost pump, and water storage reservoirs.

5.2.1 Monitoring for Bacteriological Contamination with MicroFunnel™ Plus Filter Funnels

Membrane filtration (MF) is widely accepted throughout the world for the analysis of microbial contamination in fluid samples. Using the MF technique, microorganisms are captured on a microporous membrane filter surface and grown into countable colonies by incubation of the filter with a suitable growth medium. Pall Life Sciences has designed the MicroFunnel Plus filter funnel (see Figure 5.6) to simplify this testing process. This filter funnel can be used in accordance with the MF procedures referenced in Standard Methods for the Examination of Water and Wastewater, 20th edition, and the U.S. Environmental Protection Agency's Microbiological Methods for Monitoring the Environment, 600/8-78-017. MicroFunnel filter funnels also meet the USP-24 requirements for products used for the MF technique.

Figure 5.6
MicroFunnel Filter Funnels for Microbiology Testing

The MicroFunnel Plus filter funnel is supplied pre-assembled and sterilized by gamma irradiation to eliminate the potential for toxic residuals associated with EtO sterilization. The integral unit and membrane ensure high bacterial recoveries and no grid line inhibition. After capture of the microorganisms, the membrane is easily removed from the base via a unique squeeze separation process, without interfering with the membrane. This greatly simplifies transfer to the growth media-soaked absorbent pad incorporated into the cap. The full specifications of the MicroFunnel Plus system are summarized in Table 5.6. Three membrane types are available:

- GN-6 Metricel® membrane: a 0.45 µm mixed cellulose ester membrane ideal for use in most applications.
- Supor® membrane: a 0.2 µm polyethersulfone membrane ideal for its low binding characteristics and superior retention of small organisms such as *Pseudomonas sp*.
- Metricel Black membrane: a 0.45 µm modified polyethersulfone membrane ideal for yeast and mold analysis or providing good contrast for light-colored colonies.

Table 5.6
Specifications for MicroFunnel™ Plus Microbiology Testing Device

	Parameter	
Specification	MicroFunnel Plus 100 mL	MicroFunnel Plus 300 mL
Membrane	0.45 µm GN-6 Metricel® mixed cellulose ester membrane 0.2 µm Supor® polyethersulfone membrane Black 0.45 µm Metricel modified polyethersulfone membrane	
Device		
Support Pad	Cellulose	
Cylinder Base and Petri Dish Lid (LP	Polypropylene	
Cover	Polysyrene	
Plug	Polyethylene	
Funnel Adapter	Polyethylene (not autoclavable)	
Effective Filtration Area	13.46 cm^2	
Dimensions		
Height (with Lid Petri Dish)	8.05 cm (3.17 in.)	NA
Height with Cover	7.62 cm (3.00 in.)	9.09 cm (3.58 in.)
Diameter(with Lid Petri Dish)	6.40 cm (2.52 in.)	NA
Diameter with Cover	6.05 cm (2.38 in.)	8.84 cm (3.48 in.)
Capacities	100 mL	300 mL
Operating Vacuum	635 mm Hg (25 in. Hg)	
Sterilization	Individually packed and sterilized by gamma irradiation	

In this section, protocols will be described for use of MicroFunnel™ Plus disposable devices for testing aqueous samples for microbial contamination. Culture media ampoules are available for a range of bacterial, yeast, and fungal contaminants and are summarized in a product selection guide in Table 5.7.

Table 5.7
Application Selection Guide for MicroFunnel Plus

Test Method	Method Number*	Recommended Filter	Media Broth
Total Coliforms	9222	GN-6 Metricel®	MF-Endo
Fecal Coliforms, *E. coli*	9222	GN-6 Metricel	M-FC
Total Bacteria	9215; USP 61; 71	GN-6 Metricel, Supor®	M-TGE; TSB-USP; HPC
Lactobacillus sp. detection	—	GN-6 Metricel	Orange Serum
Yeast and Mold	9610	GN-6 Metricel, Black Supor	M-Green YM
Fecal *Streptococcus*	9230	GN-6 Metricel	KF-Streptococcal
Pseudomonas sp.	9213	Supor	Pseudomonas

**Standard Methods for the Examination of Water and Wastewater, 19th ed. and U.S. Pharmacopoeia XXIV*

Protocol for Monitoring for Bacteriological Contamination with MicroFunnel Plus Filter Funnels

A. Materials Required

1. MicroFunnel Plus pre-sterilized devices in 100 and 300 mL volume sizes
   - **a)** 0.45 µm GN-6 Metricel membrane, gridded
   - **b)** 0.2 µm Supor membrane
   - **c)** Metricel Black modified polyethersulfone membrane
2. MicroFunnel Plus LP (PN 4810) with 0.45 µm GN-6 Metricel membrane, white, gridded, sterile with absorbent pad incorporated into the cap for the funnel, 50/pkg
3. Selective growth media ampoules (2 mL volume)
4. Sterile petri dishes and absorbent pad (PN 7245)
5. Sterile phosphate buffered saline (PBS)
6. Stainless steel forceps (PN 51147)
7. Filter funnel manifold, single place in aluminum (PN 15408)
8. Hand operated vacuum pump (PN 4041) and filtering flask with sidearm (PN 4040)
9. Source of vacuum [63.5 cm Hg (25 in. Hg)] fitted with an in-line VacuShield hydrophobic PTFE filter (PN 4402)
10. Microbiological incubator

B. Operation of the MicroFunnel™ Plus Device to Collect Microorganisms and Growth Inside the Same Device

In this next section, handling of the above funnel system will require the use of aseptic techniques to avoid environmental contamination of the sample to be tested. This manual assumes that the operator is aware of basic sterile techniques which will not be covered in detail in the following protocols. There are several culture media ampoules available for a range of bacterial, yeast, and fungal contaminants summarized in a product selection guide in Table 5.7. It may be necessary to process several parallel samples in different culture media to cover bacterial, yeast, and fungal contaminants.

1. Carefully remove the vented lid under aseptic or clean conditions to protect the sterility of the MicroFunnel device.
2. Collect the sample and introduce into the open device with a sterile or clean measuring cylinder. Make a notation of the sample volume.
3. Snap the vented lid back in place and seal the device for transport to the microbiology lab for testing. Label device to identify the sample.
4. Before mounting on the filtration manifold (PN 15408), remove the plug or vent tab from the base of the device. Place on manifold and draw liquid sample through the membrane filter.
5. Wash the membrane surface with 2 x 25 mL of sterile PBS.

Tip: *This step may require more than 2 x 25 mL of sterile PBS, depending on whether the sample matrix is more complex than a water sample. It is important to remove components of the original sample that might inhibit rapid growth on the specific culture media. Organisms may be present in the sample and only growing very slowly.*

6. Gently grasp the funnel and remove and discard the lid (see Figure 5.7).

Figure 5.7

Separation of the Funnel from the Base of the MicroFunnel Plus Filter Funnel

7. Release funnel cylinder from base by firmly squeezing the midpoint of the cylinder.
8. Culture the samples in the MicroFunnel filter funnel base by gently dispensing 2 mL of culture media over the surface sample and allowing it to be drawn into the pad. It may be necessary to momentarily apply vacuum just until the media is drawn through the membrane into the pad.

9. Replace the cover onto the base of the MicroFunnel™ unit to convert into a Petri dish and discard the cylinder.

C. Culture of the Microorganisms on the Filter in a Petri Plate

1. Soak adsorbent pad in sterile petri dish (PN 7245) with appropriate selective growth media.
2. Remove filter from the MicroFunnel base with sterilized forceps and carefully place on the absorbent pad in the petri dish.
3. Replace the cap on the petri dish, invert, and incubate at 37 ºC till colonies appear on the gridded membrane (see Figure 5.8).

Figure 5.8
Addition of Growth Medium to the Cap of the MicroFunnel Plus LP Device

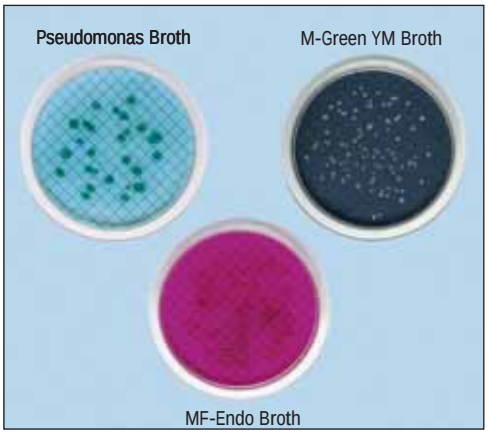
D. Culture of the Microorganisms in the Cap of a MicroFunnel Plus LP

1. Dispense the contents of an ampoule of culture medium onto the absorbent pad in the Petri dish lid kit (supplied only with MicroFunnel LP, PN 4810).
2. Following the procedure described in Step 1.2.7 and remove the membrane filter from the base with forceps.
3. Place the membrane filter onto the broth-soaked absorbent pad in the petri dish lid kit. Cover, invert, and incubate.

E. Interpretation of the Results

1. After incubation for 24-48 hours (depending on media used), single isolated colonies of microorganism should be visible on the plates (see Figure 5.9).

Figure 5.9
Examples of Microorganisms Cultured on the Membranes in a MicroFunnel™ Plus Device



2. Count the number of colonies by placing on a light box to backlight the plates. Calculate the number of organisms per unit volume of sample.

Tip: *Duplicate samples should be run to allow for uneven distribution of the contaminating microorganism in the original sample.*

3. If a large number of colonies are seen that are too dense to count, it may be necessary to repeat the study with an original sample diluted with sterile PBS to lower the number of organisms cultured on the filter.

Ordering Information for Monitoring for Bacteriological Contamination with MicroFunnel™ Plus Filter Funnels

Microfunnel Filter Funnels

Part Number	Description	Pkg
4807*	0.45 µm GN-6 Metricel® membrane, white, gridded, sterile, individually bagged, 100 mL capacity	50/pkg
4801	LP unit with 0.45 µm GN-6 Metricel membrane, white, gridded, sterile, individually bagged, Petri dish lid	50/pkg
4808*	0.45 µm Metricel Black membrane, gridded, sterile, individually bagged,100 mL capacity	50/pkg
4809	0.2 µm Supor® membrane, white, gridded, sterile, individually bagged, 100 mL capacity	50/pkg
4823	0.45 µm Supor membrane, white, gridded, sterile, individually bagged, 100 mL capacity	50/pkg
4813	0.2 µm Supor membrane, white, gridded, sterile, individually bagged, 300 mL capacity	20/pkg
4814	0.45 µm Supor membrane, white, gridded, sterile, individually bagged, 300 mL capacity	20/pkg

**For use with ambient temperature samples only.*

Microbiological Media (2 mL Plastic Ampoules)

Part Number	Description	Pkg
4302	M-FC Broth with rosolic acid, Fecal Coliforms	50/pkg
4306	Pseudomonas Broth, *Pseudomonas sp.*	50/pkg
4307	Trypticase Soy Broth – USP, Total Bacteria	50/pkg
4352	HPC Media with TTC Indicator, Total Bacteria	50/pkg
68105	MF-Endo Broth, Total Coliforms	50/pkg
68106	M-TGE Broth, Total Bacteria	50/pkg
68107	M-Green YM Broth, yeast and mold	50/pkg
68108	KF-Streptococcal Broth, *Fecal Streptococcus*	50/pkg
68109	Orange Serum Broth, *Lactobacillus sp.*	50/pkg

5.2 – Section 5.2.1

Notes