



# Environmental Monitoring

## Product Guide



**Sample Collection, Preparation, and  
Analysis for Air, Water, and Soil**

[www.millipore.com/EMsample](http://www.millipore.com/EMsample)

# Environmental Monitoring

Whether you need to collect large quantities of air to monitor particulate contamination, or analyze soil or water for hazardous chemicals, we can supply the expertise, products and protocols to ensure superior analytical results and compliance with regulatory requirements. Millipore devices and systems designed for environmental applications have been developed for use with standard methods, including those of NIOSH, OSHA™, and ASTM™.



## Air Monitoring

Alpha particle monitoring  
Industrial particulates



## Soil Monitoring

Toxicity Characteristic Leaching  
Procedure (TCLP)  
Extraction  
Gas chromatography  
Ion chromatography



## Water Testing

Ground water  
Waste water  
Drinking water  
Storm drain water

This product guide is designed to support each step of your environmental monitoring workflow. Products are organized according to the part of the monitoring workflow in which they are used. For reference, we also include a guide to filter selection, accessories, and examples of standard methods for sample analysis.

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# Millipore supports you at every stage of the environmental monitoring workflow.



## Sample Collection

Whether you need to collect large quantities of air to monitor particulate contamination, or analyze soil or water for hazardous chemicals, we can supply the expertise, products and protocols to ensure superior analytical results and compliance with regulatory requirements.

- Sampling Kits
- Filter Discs
- Filter Holders
- Monitors
- Monitor Refills
- Solvent Dispensers



## Sample Preparation

For the best downstream results, choose the best upstream tools. Sample preparation with Millipore filtration products ensures fast, accurate, reproducible results, for every type of sample. Whether you are filtering 1 mL or 5 L, you can choose a sample preparation device with the right membrane and chemical compatibility for your application.

- Syringe Filters
- Filter Discs
- Filter Holders
- Vacuum- and Pressure-Driven Filtration Equipment



## Sample Analysis

Millipore gives you more than products for your environmental monitoring workflow, we give you knowledgeable technical service and support for your particular analysis application. We can help you choose products which will give you reliable results to fit your chosen method of analysis, relevant to the protocols listed here and on page 11.

- Gravimetric
- Microscopic
- HPLC

# Radiation Monitoring

In order to reap the benefits of nuclear energy responsibly, both users and regulatory organizations must monitor the degree to which radioactive byproducts of human activity enter the environment. Human activities that generate radioactive particles include scientific experiments involving radiation, medical therapies, nuclear-powered submarines, x-ray procedures, nuclear power plants, and smoke detectors. The potential for misuse of radioactive materials and weapons by terrorist organizations and other criminals also demands vigilant radiation monitoring.

Nuclear power is relatively clean and renewable, and through radiation monitoring, can be a safe source of energy for the planet. Although there are many naturally occurring radioisotopes that make up water, air, soil, and organisms, the challenge in radiation monitoring is to detect the "non-natural" radiation signal above the naturally occurring background radiation levels.

To support efficient, convenient radiation monitoring, Millipore has developed a special Fluoropore™ membrane filter designed for alpha particle collection in continuous air monitors.

## The Fluoropore filter for alpha particle monitoring provides:

### Improved Data Collection

Unlike fibrous filter media that trap particles in their matrix, Fluoropore (hydrophobic PTFE) membranes collect particles on their surface. This surface collection provides better detection efficiencies and improved resolution.

### Choice of Pore Sizes

Fluoropore membranes are available in 3 and 5 µm pore sizes. The smaller pore size provides high resolution. The larger pore size has very low pressure drop and greater throughput capacity, which minimizes the number of filter changeouts.

### Contrasting Backing Material

The 5 µm Fluoropore membrane is bonded to a contrasting backing made from high density polyethylene fiber. The contrast between the top and bottom of the filter prevents incorrect installation in sampling devices. The backing also reduces the electrostatic charge of the filters and makes them easier to handle.

## ORDERING INFORMATION

| Pore Size | Diameter (mm) | Qty/Pk | Catalogue No. |
|-----------|---------------|--------|---------------|
| 3 µm      | 25            | 100    | FSLW 025 00   |
|           | 47            | 100    | FSLW 047 00   |
|           | 90            | 25     | FSLW 090 25   |
| 5 µm      | 47            | 100    | FMLB 047 00   |

# Sample Collection



Collection is the first step of air, water and soil testing. An appropriate, representative sample is critical for accurate results. Millipore offers products for collecting diverse samples such as in-line purified water, liquid from cooling towers, air or other gases, and environmental field samples.



# Products for Environmental Sample Collection



## Aerosol Filter Holders

Vacuum-filter air or other gases from open atmospheres or from closed systems for particulate contamination analysis.

| Description                            | Catalogue No. |  |
|----------------------------------------|---------------|-------------------------------------------------------------------------------------|
| Standard Stainless Steel Filter Holder | XX5004700     |                                                                                     |
| Open Stainless Steel Filter Holder     | XX5004710     |                                                                                     |

## Three-piece, 25 and 37 mm Aerosol Analysis Monitors

Aerosol monitors contain 0.45 µm and 0.8 µm MCE membranes. Convenient matched weight monitors include two filters matched to within 0.1 mg. A cellulose support seal between monitor sections distributes sample evenly over the filter.

| Description                                                                    | Catalogue No. |
|--------------------------------------------------------------------------------|---------------|
| 25 mm Monitor, Type A Pre-loaded with Filter and Cellulose Pad – 0.8 µm pores  | MAWP025A0     |
| 25 mm Monitor, Type B* Pre-loaded with Filter and Cellulose Pad – 0.8 µm pores | MAWP025AC     |
| 37 mm Monitor, Complete with Filter – 0.8 µm pores                             | MAWP037A0     |
| 37 mm Monitor, Complete with Filter – 0.45 µm pores                            | MHWP037A0     |
| Matched-weight Aerosol Analysis Monitor – 0.8 µm pores                         | MAWP037AM     |

\*Use Type B monitor for airborne asbestos monitoring in accordance with NIOSH specifications.



### Monitor Components

|                                                   |           |
|---------------------------------------------------|-----------|
| Empty 37 mm Monitor Cassette with Rings and Plugs | M000037A0 |
| Empty Monitor Case without Ring                   | M00003700 |
| Monitor Ring                                      | M000037RS |

## Samplers

Pocket-sized samplers for semi-quantitative monitoring are ready-to-use, sterilized devices containing dehydrated media and filter.

| Description                                                                 | Catalogue No. |  |
|-----------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------|
| Coli-Count, measures total coliforms                                        | MC0010025     |                                                                                       |
| Yeast and Mold                                                              | MY0010025     |                                                                                       |
| Total Count (bacteria)                                                      | MT0010025     |                                                                                       |
| HPC Total Count, measures heterotrophic (environmentally stressed) bacteria | MHPC10025     |                                                                                       |

## Groundwater Sampling Capsules

Disposable, EPA-accepted method for collecting groundwater prior to dissolved metals analysis.

| Description                   | Pore Size (µm) | Catalogue No. |
|-------------------------------|----------------|---------------|
| Groundwater Sampling Capsules | 0.45           | GWSC04501     |
|                               | 1.0            | GWSC10001     |
|                               | 5.0            | GWSC50001     |





# Membranes for Contamination Monitoring



## 1. Glass Fiber Filters

Borosilicate microfiber glass without binder resin. Gravimetric stability up to 500 °C. For suspended solids in water and waste water.

## 2. Isopore™ Membrane Filters

Polycarbonate film. Consistently low ash and tare weights. Hydrophilic, non-hygroscopic. For Chemotaxis, Environmental/air analysis.

## 3. PTFE Membranes

### Fluoropore Membrane Filters

Bonded to high-density polyethylene support for easier handling. Broad chemical compatibility. For air monitoring, prefiltration of solvents.

### Mitex™ Membrane Filters

Unsupported PTFE membrane. It can be used under extreme chemical or temperature conditions that other membranes cannot withstand (up to 260 °C). Broad chemical compatibility.

### LCR Membrane Filters

Hydrophilized PTFE. LCR is compatible with all commonly used HPLC solvents. It can be used to filter aqueous fluids without prior wetting.

### Omnipore™ Membrane Filters

Hydrophilic PTFE compatible with virtually all solvents, acids and alkaline solutions.

## 4. Nylon Membrane Filters

Nylon polyamide 6,6. Use for large particle filtration, particle analysis, prefiltration of solvents.

## 5. MCE Membrane filters

Mixed cellulose esters. For monitoring particulate contamination in air and clarification and sterilization of fluids.

## 6. Quartz Membrane Filters

Pure quartz fibers with no glass fibers or binders. For measurement of heavy metal concentrations and small amounts of particles (such as the USEPA PM 10 ambient air monitoring method).

## 7. Durapore® Membrane Filters

PVDF (polyvinylidene fluoride). For monitoring particulate contamination in air and clarification and sterilization of fluids.

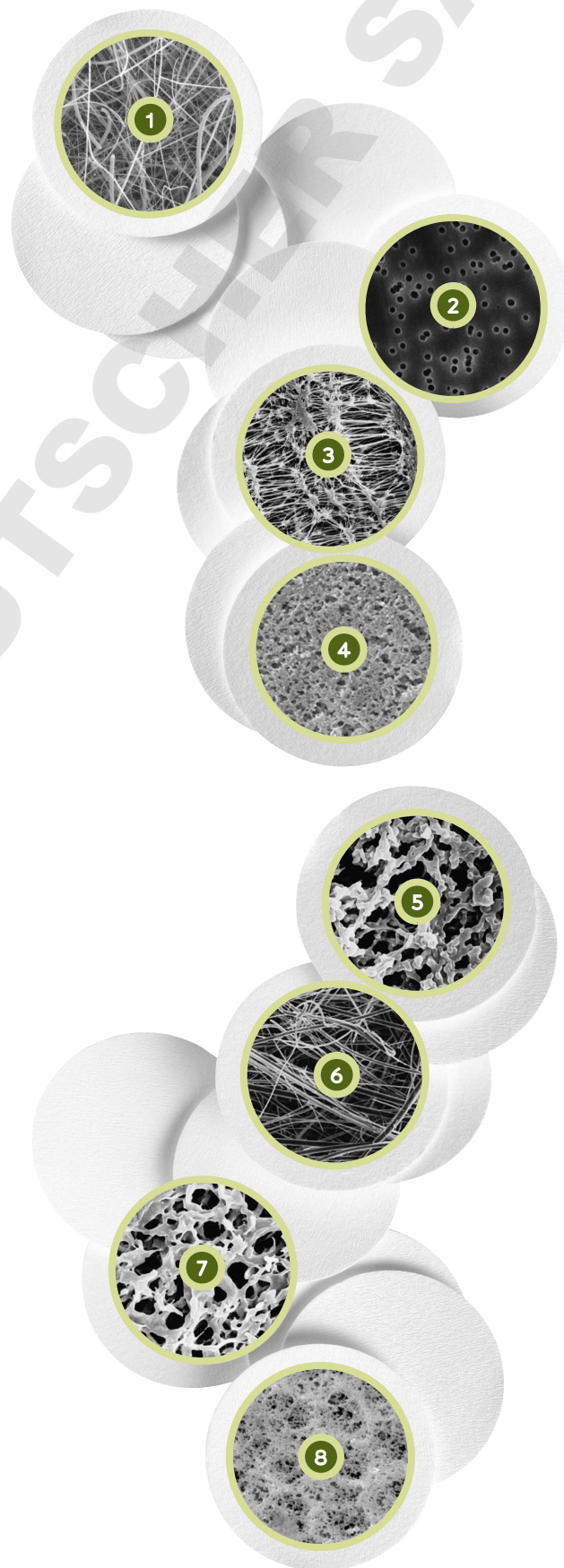
## 8. PVC Membrane Filters

Pure, medical-grade PVC. Low weight and low moisture pick-up. For monitoring silica, carbon black or metal particles in air. Excellent for gravimetric analysis.

## Silver Membrane Filters (not shown)

Pure silver. For monitoring of carbon black, coal tar products, coke oven emissions and silica in air.

For a list of filter choices and ordering information, see page 13-14.



# Sample Preparation



Proper sample handling and preparation should begin immediately after collection to ensure accurate downstream analysis. Millipore's family of certified sample preparation devices provide a disposable, yet reliable method for collecting and preparing environmental samples.

For ultimate quality and convenience, use Millex® syringe filters. With their low extractables and low binding membranes, Millex filters are ideal for sensitive instrumental analysis, including gas, liquid and ion chromatography. A wide range of chemical compatibility enables their use with virtually any sample composition.





# Products for Environmental Sample Preparation



## Millex Syringe Filters

| Filter Diameter (mm) | Recommended Sample Volume (mL) |
|----------------------|--------------------------------|
| 4                    | <1                             |
| 13                   | <10                            |
| 25 and 33            | <100                           |



## Millex-LCR Filters for HPLC

4, 13, and 25 mm Millex-LCR filter units are low extractable filters specifically designed for HPLC.

- HPLC Certified for low extractables
- Low binding hydrophilic PTFE membrane
- Filters both aqueous and organic solvents

13 mm size available with extended tube outlet for convenient filtration directly into autosampler vials or other small vessels.

| Description                        | Pore size (µm) | Diameter (mm) | Catalogue No. |
|------------------------------------|----------------|---------------|---------------|
| Millex-LCR filters                 | 0.45           | 4             | SLLHR04NL     |
|                                    | 0.45           | 13            | SLCR013NL     |
|                                    | 0.45           | 25            | SLCR025NB     |
| Millex-LCR filter with tube outlet | 0.45           | 13            | SLCRT13NL     |



## IC-Millex Filters for Ion Chromatography

13 and 25 mm low extractable filters specifically designed for ion chromatography sample preparation.

| Description          | Pore size (µm) | Diameter (mm) | Catalogue No. |
|----------------------|----------------|---------------|---------------|
| IC Millex-LG filters | 0.20           | 4             | SLLGR04NL     |
|                      | 0.20           | 13            | SLLGC13NL     |
|                      | 0.20           | 25            | SLLGC25NS     |
| IC Millex-LH filters | 0.45           | 13            | SLLHC13NL     |
|                      | 0.45           | 25            | SLLHC25NS     |





## Millex Syringe Filters for Sample Filtration

### Millex filters with Durapore membrane

| Description | Pore size (µm) | Diameter (mm) | Catalogue No. |
|-------------|----------------|---------------|---------------|
| Millex-GV   | 0.22           | 4             | SLGVR04NL     |
|             | 0.22           | 13            | SLGV013NL     |
|             | 0.22           | 33            | SLGV033NS     |
| Millex-HV   | 0.45           | 4             | SLHVR04NL     |
|             | 0.45           | 13            | SLHV013NL     |
|             | 0.45           | 33            | SLHV033NS     |

### Millex filters with Nylon membrane

| Description | Pore size (µm) | Diameter (mm) | Catalogue No. |
|-------------|----------------|---------------|---------------|
| Millex-GN   | 0.20           | 4             | SLGNR04NL     |
|             | 0.20           | 13            | SLGN013NL     |
|             | 0.20           | 33            | SLGN033NS     |
| Millex-GV   | 0.45           | 4             | SLHNR04NL     |
|             | 0.45           | 13            | SLHN013NL     |
|             | 0.45           | 33            | SLHN033NS     |



## HPF Millex Filters for High Particulate Filtration

This dual membrane Millex filter is ideal for clarification of particulate-laden solutions prior to instrument analysis. The product includes two different media: a graduated glass fiber prefilter (10.0 to 0.7 µm) to remove larger particles and a 0.45 µm membrane filter for fine filtration.

- Two to four times greater throughput than syringe filters without prefilters
- Manual or automated use

### HPF Millex filters with Nylon (HN) or Durapore (HV) membrane

| Description    | Pore size (µm) | Diameter (mm) | Catalogue No. |
|----------------|----------------|---------------|---------------|
| Millex-HPF HN  | Prefilter/0.45 | 25            | SLHNM25NS     |
| Millex-HPF GN  | Prefilter/0.20 | 25            | SLGNM25NS     |
| Millex-HPF HV  | Prefilter/0.45 | 25            | SLHVM25NS     |
| Millex-HPF LG  | Prefilter/0.20 | 25            | SLLGM25NS     |
| Millex-HPF LCR | Prefilter/0.45 | 25            | SLCRM25NS     |

For a complete listing of non-sterile Millex syringe filters, visit [www.millipore.com/NSmillex](http://www.millipore.com/NSmillex).

# Sample Analysis



To provide more informative environmental testing results, manufacturers of analytical instruments are constantly developing new technologies with lower and lower detection limits, demanding that samples be treated with the highest quality analysis tools.

Millipore devices and systems designed for environmental monitoring analysis have been developed for use with standard methods, including those of NIOSH, OSHA, and ASTM.

## EXAMPLES OF REGULATED METHODS ARE:

| Method                        | Application      | Recommended Millipore Products |
|-------------------------------|------------------|--------------------------------|
| NIOSH 5006                    | Air Monitoring   | M000037A0                      |
| ASTM D4382-2                  | Water Monitoring | HAWP04700                      |
| EPA 1311                      | Soil Monitoring  | YT30090HW                      |
|                               |                  | YT30142HW                      |
|                               |                  | AP4009000                      |
| OSHA Standard 1910.1001 App A | Air Monitoring   | MAWP025AC                      |

To get product recommendations on other methods, contact technical service at [www.millipore.com/techservice](http://www.millipore.com/techservice).

# Filtration Systems



## Hazardous Waste Filtration Systems

For use in:

- USEPA EP Toxicity Test (EPA Method 1310) for non-volatile or semi-volatile waste
- Toxicity Characteristic Leaching Procedure (TCLP) applications (EPA Method 1311)
  - Separates solid and liquid phases of waste samples
  - Contains interior holder with PTFE coating to prevent heavy metal contamination
  - Allows easy introduction of bulky samples through wide entry port and removable top plate

| Description                         | Catalogue No. |  |
|-------------------------------------|---------------|--------------------------------------------------------------------------------------|
| Hazardous Waste Filtration System   | YT30142HW     |                                                                                      |
| Filter                              | AP4014250     |                                                                                      |
| Millipore Rotary Agitator 115V/60Hz | YT310RAHW     |                                                                                      |

## ZHE Hazardous Waste Filtration System

Millipore's ZHE (Zero Head Space Extractor) system has been designated by the USEPA as a suitable apparatus for Toxicity Characteristic Leaching Procedure (TCLP) for volatile substances.

- Pressurizes filter without introducing air because of movable piston design
- Prevents loss of volatiles
- Use with 90 mm filters

| Description                           | Catalogue No. |  |
|---------------------------------------|---------------|---------------------------------------------------------------------------------------|
| ZHE Hazardous Waste Filtration System | YT30090HW     |                                                                                       |
| Filter                                | AP4009000     |                                                                                       |

# Filter Selection Guide for Environmental Monitoring

| Filter Code | Diameter (mm) | Qty/Pk | Catalogue No. | Sample |
|-------------|---------------|--------|---------------|--------|
|-------------|---------------|--------|---------------|--------|

## Glass Fiber Membranes

|      |     |     |             |                                                                                   |
|------|-----|-----|-------------|-----------------------------------------------------------------------------------|
| APFA | 25  | 100 | APFA 025 00 |  |
|      | 37  | 100 | APFA 037 00 |                                                                                   |
|      | 47  | 100 | APFA 047 00 |                                                                                   |
| APFB | 25  | 100 | APFB 025 00 |                                                                                   |
|      | 37  | 100 | APFB 037 00 |                                                                                   |
|      | 47  | 100 | APFB 047 00 |                                                                                   |
|      | 90  | 50  | APFB 090 50 |                                                                                   |
| APFC | 25  | 100 | APFC 025 00 |                                                                                   |
|      | 37  | 100 | APFC 037 00 |                                                                                   |
|      | 47  | 100 | APFC 047 00 |                                                                                   |
|      | 90  | 50  | APFC 090 50 |                                                                                   |
| APFD | 25  | 100 | APFD 025 00 |                                                                                   |
|      | 37  | 100 | APFD 037 00 |                                                                                   |
|      | 47  | 100 | APFD 047 00 |                                                                                   |
|      | 90  | 50  | APFD 090 50 |                                                                                   |
| APFF | 25  | 100 | APFF 025 00 |                                                                                   |
|      | 37  | 100 | APFF 037 00 |                                                                                   |
|      | 47  | 100 | APFF 047 00 |                                                                                   |
|      | 90  | 50  | APFF 090 50 |                                                                                   |
| AP40 | 25  | 100 | AP40 025 00 |                                                                                   |
|      | 37  | 500 | AP40 037 05 |                                                                                   |
|      | 47  | 100 | AP40 047 00 |                                                                                   |
|      |     | 500 | AP40 047 05 |                                                                                   |
|      | 90  | 100 | AP40 090 00 |                                                                                   |
|      | 142 | 50  | APFF 142 50 |                                                                                   |

## Quartz Membranes

|      |    |     |             |                                                                                     |
|------|----|-----|-------------|-------------------------------------------------------------------------------------|
| AQFA | 37 | 100 | AQFA 037 00 |  |
|      | 47 | 100 | AQFA 047 00 |                                                                                     |
|      | 90 | 50  | AQFA 090 50 |                                                                                     |

| Pore Size (µm) | Diameter (mm) | Qty/Pk | Catalogue No. | Sample |
|----------------|---------------|--------|---------------|--------|
|----------------|---------------|--------|---------------|--------|

## Nylon Membranes

|      |    |     |             |                                                                                     |
|------|----|-----|-------------|-------------------------------------------------------------------------------------|
| 0.2  | 25 | 100 | GNWP 025 00 |  |
|      | 47 | 100 | GNWP 047 00 |                                                                                     |
| 0.45 | 25 | 100 | HNWP 025 00 |                                                                                     |
|      | 47 | 100 | HNWP 047 00 |                                                                                     |
| 0.8  | 25 | 100 | ANWG02500   |                                                                                     |
|      | 47 | 100 | ANWG04700   |                                                                                     |
| 1.2  | 25 | 100 | RNWG02500   |                                                                                     |
|      | 47 | 100 | RNWG04700   |                                                                                     |

| Pore Size (µm) | Diameter (mm) | Qty/Pk | Catalogue No. | Sample |
|----------------|---------------|--------|---------------|--------|
|----------------|---------------|--------|---------------|--------|

## PTFE Membranes

### Fluoropore (PTFE) Membrane Filters

|      |    |     |             |                                                                                     |
|------|----|-----|-------------|-------------------------------------------------------------------------------------|
| 0.22 | 25 | 100 | FGLP 025 00 |  |
|      | 47 | 100 | FGLP 047 00 |                                                                                     |
|      | 90 | 50  | FGLP 090 50 |                                                                                     |
| 0.5  | 25 | 100 | FHLP 025 00 |                                                                                     |
|      | 47 | 100 | FHLP 047 00 |                                                                                     |
|      | 90 | 50  | FHLP 090 50 |                                                                                     |
| 1.0  | 25 | 100 | FALP 025 00 |                                                                                     |
|      | 47 | 100 | FALP 047 00 |                                                                                     |
|      | 90 | 50  | FALP 090 50 |                                                                                     |

### Unlaminated Fluoropore (PTFE) Membrane Filter

|      |    |     |             |
|------|----|-----|-------------|
| 0.45 | 47 | 100 | FHUP 047 00 |
|------|----|-----|-------------|

### Mitex (PTFE) Membrane Filters (plain)

|     |    |     |             |
|-----|----|-----|-------------|
| 5.0 | 25 | 100 | LSWP 025 00 |
|     | 37 | 100 | LSWP 037 00 |
|     | 47 | 100 | LSWP 047 00 |
|     | 90 | 25  | LSWP 090 25 |

### Mitex (PTFE) Membrane Filters (gridded)

|     |    |     |             |
|-----|----|-----|-------------|
| 5.0 | 25 | 100 | LSWG 025 00 |
|     | 47 | 100 | LSWG 047 00 |

### LCR (Hydrophilic PTFE) Membrane Filters

|      |    |     |             |
|------|----|-----|-------------|
| 0.45 | 25 | 100 | FHLC 025 00 |
|      | 47 | 100 | FHLC 047 00 |

### Omnipore (Hydrophilic PTFE) Membrane Filters

|      |    |     |             |
|------|----|-----|-------------|
| 0.2  | 25 | 100 | JGWP 025 00 |
|      | 47 | 100 | JGWP 047 00 |
|      | 90 | 25  | JGWP 090 25 |
| 0.45 | 25 | 100 | JHWP 025 00 |
|      | 47 | 100 | JHWP 047 00 |
|      | 90 | 25  | JHWP 090 25 |
| 5.0  | 25 | 100 | JMWP 025 00 |
|      | 47 | 100 | JMWP 047 00 |
|      | 90 | 25  | JMWP 090 25 |

## PVC Membranes

|     |    |     |             |                                                                                       |
|-----|----|-----|-------------|---------------------------------------------------------------------------------------|
| 0.8 | 25 | 100 | PVC0 825 00 |  |
|     | 37 | 100 | PVC0 837 00 |                                                                                       |
|     | 47 | 100 | PVC0 847 00 |                                                                                       |
| 5.0 | 25 | 100 | PVC5 025 00 |                                                                                       |
|     | 37 | 100 | PVC5 037 00 |                                                                                       |
|     | 47 | 100 | PVC5 047 00 |                                                                                       |

| Pore Size (µm) | Diameter (mm) | Qty/Pk | Catalogue No. | Sample |
|----------------|---------------|--------|---------------|--------|
|----------------|---------------|--------|---------------|--------|

## MCE Membranes

### Standard MF-Millipore Membranes (white, plain)

|      |    |       |                          |                                                                                   |
|------|----|-------|--------------------------|-----------------------------------------------------------------------------------|
| 0.22 | 25 | 100   | GSWP 025 00              |  |
|      | 37 | 100   | GSWP 037 00 <sup>1</sup> |                                                                                   |
|      | 47 | 100   | GSWP 047 00              |                                                                                   |
|      | 90 | 100   | GSWP 090 00              |                                                                                   |
| 0.45 | 25 | 100   | HAWP 025 00              |                                                                                   |
|      | 37 | 100   | HAWP 037 00 <sup>1</sup> |                                                                                   |
|      | 47 | 100   | HAWP 047 00              |                                                                                   |
|      | 90 | 100   | HAWP 090 00              |                                                                                   |
| 0.8  | 25 | 100   | AAWP 025 00              |                                                                                   |
|      | 37 | 100   | AAWP 037 00 <sup>1</sup> |                                                                                   |
|      |    | 100   | AAWP 037 P0 <sup>3</sup> |                                                                                   |
|      |    | 50 pr | AAWP 037 PM <sup>4</sup> |                                                                                   |
|      | 47 | 100   | AAWP 047 00              |                                                                                   |
|      |    | 50 pr | AAWP 047 OM <sup>2</sup> |                                                                                   |
| 5.0  | 90 | 100   | AAWP 090 00              |                                                                                   |
|      | 25 | 100   | SMWP 025 00              |                                                                                   |
|      | 37 | 100   | SMWP 037 00 <sup>1</sup> |                                                                                   |
|      | 47 | 100   | SMWP 047 00              |                                                                                   |
|      | 90 | 25    | SMWP 090 25              |                                                                                   |

### Standard MF-Millipore Membranes (white, gridded)

|      |    |     |                          |  |
|------|----|-----|--------------------------|--|
| 0.45 | 25 | 100 | HAWG 025 00              |  |
|      | 37 | 100 | HAWG 037 00              |  |
|      | 47 | 100 | HAWG 047 00              |  |
| 0.8  | 25 | 100 | AAWG 025 00 <sup>5</sup> |  |
|      | 37 | 100 | AAWG 037 00              |  |
|      |    | 100 | AAWG 037 P0 <sup>3</sup> |  |
|      | 47 | 100 | AAWG 047 00              |  |

### Standard MF-Millipore Membranes (black, plain)

|      |    |     |             |  |
|------|----|-----|-------------|--|
| 0.45 | 25 | 100 | HABP 025 00 |  |
|      | 47 | 100 | HABP 047 00 |  |
| 0.8  | 25 | 100 | AABP 025 00 |  |
|      | 47 | 100 | AABP 047 00 |  |

### Standard MF-Millipore Membranes (black, gridded)

|      |    |     |                          |  |
|------|----|-----|--------------------------|--|
| 0.45 | 25 | 100 | HABG 025 00              |  |
|      | 37 | 100 | HABG 037 00 <sup>1</sup> |  |
|      | 47 | 100 | HABG 047 00              |  |
| 0.8  | 25 | 100 | AABG 025 00              |  |
|      | 37 | 100 | AABG 037 00              |  |
|      | 47 | 100 | AABG 047 00              |  |

For additional pore sizes and diameters, visit [www.millipore.com/sampleprep](http://www.millipore.com/sampleprep).

| Pore Size (µm) | Diameter (mm) | Qty/Pk | Catalogue No. | Sample |
|----------------|---------------|--------|---------------|--------|
|----------------|---------------|--------|---------------|--------|

## PVDF Membranes

### Hydrophilic Durapore Membrane Filters

|      |    |     |                          |                                                                                     |
|------|----|-----|--------------------------|-------------------------------------------------------------------------------------|
| 0.22 | 25 | 100 | GVWP 025 00              |  |
|      | 47 | 100 | GVWP 047 00              |                                                                                     |
|      | 90 | 50  | GVWP 090 50              |                                                                                     |
| 0.45 | 25 | 100 | HVLP 025 00              |                                                                                     |
|      | 47 | 100 | HVLP 047 00              |                                                                                     |
|      | 90 | 50  | HVLP 090 50              |                                                                                     |
| 5.0  | 25 | 100 | SVLP 025 00              |                                                                                     |
|      | 47 | 100 | SVLP 047 00              |                                                                                     |
|      | 47 | 100 | SVWG 047 00 <sup>6</sup> |                                                                                     |
|      | 90 | 50  | SVLP 090 50              |                                                                                     |

### Hydrophobic Durapore Membrane Filters

|      |    |     |             |  |
|------|----|-----|-------------|--|
| 0.22 | 25 | 100 | GVHP 025 00 |  |
|      | 47 | 100 | GVHP 047 00 |  |
|      | 90 | 50  | GVHP 090 50 |  |
| 0.45 | 25 | 100 | HVHP 025 00 |  |
|      | 47 | 100 | HVHP 047 00 |  |
|      | 90 | 50  | HVHP 090 50 |  |

## Polycarbonate Membranes

### White Membrane Filters

|      |    |     |             |                                                                                       |
|------|----|-----|-------------|---------------------------------------------------------------------------------------|
| 0.22 | 25 | 100 | GTTP 025 00 |  |
|      | 37 | 100 | GTTP 037 00 |                                                                                       |
|      | 47 | 100 | GTTP 047 00 |                                                                                       |
| 0.4  | 25 | 100 | HTTP 025 00 |                                                                                       |
|      | 37 | 100 | HTTP 037 00 |                                                                                       |
|      | 47 | 100 | HTTP 047 00 |                                                                                       |
|      | 90 | 30  | HTTP 090 30 |                                                                                       |
| 0.8  | 25 | 100 | ATTP 025 00 |                                                                                       |
|      | 37 | 100 | ATTP 037 00 |                                                                                       |
|      | 47 | 100 | ATTP 047 00 |                                                                                       |
| 5.0  | 25 | 100 | TMTP 025 00 |                                                                                       |
|      | 47 | 100 | TMTP 047 00 |                                                                                       |
|      | 90 | 30  | TMTP 090 30 |                                                                                       |

### Black Membrane Filters

|      |    |     |             |  |
|------|----|-----|-------------|--|
| 0.22 | 25 | 100 | GTBP 025 00 |  |
|      | 47 | 100 | GTBP 047 00 |  |
| 0.4  | 25 | 100 | HTBP 025 00 |  |
|      | 47 | 100 | HTBP 047 00 |  |

<sup>1</sup> Monitor refills with thin absorbent pads for aerosol monitoring.

<sup>2</sup> Matched weight filter pairs.

<sup>3</sup> Monitor refills with thick absorbent pads for liquid monitoring

<sup>4</sup> Monitor refills (matched weight pairs) with thick absorbent pads

<sup>5</sup> Cut from specifically selected and controlled roll stock to avoid contamination by fibers. For asbestos monitoring applications.

<sup>6</sup> The membrane disc SVWG04700 has a gridded surface.

# Accessories



## Portable Vacuum / Pressure Pumps

Millipore offers two portable pumps that provide reliable sources of vacuum or pressure. Both include easily adjusted vacuum and pressure regulators with individual gauges.

| Description                                                                                                                                                                              | Catalogue No.              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Chemical Duty Vacuum/Pressure Pump</b> <ul style="list-style-type: none"> <li>◦ 24 in. HG vacuum/UL and CE marked</li> <li>◦ For use with corrosive chemicals and solvents</li> </ul> | WP6111560<br>(115 V/60 Hz) |
|                                                                                                                                                                                          | WP6122050<br>(220 V/50 Hz) |
| <b>High Output Vacuum/Pressure Pump</b> <ul style="list-style-type: none"> <li>◦ 27.2 in. HG vacuum/UL and CE marked</li> <li>◦ Piston-driven design for greater power</li> </ul>        | WP6211560<br>(115 V/60 Hz) |
|                                                                                                                                                                                          | WP6222050<br>(220 V/50 Hz) |



## Millivac™ Vacuum Pumps

Millivac vacuum pumps are compact, maintenance-free pumps that provide a consistent source of vacuum for filtration and other laboratory applications. A patented diaphragm design has reduced the footprint of the pumps compared to conventional models.

- Use Millivac Mini Pumps to filter water and aqueous solutions
- Use Millivac Maxi Pump to filter larger volumes or viscous solutions
- Neither pump requires lubrication and neither is explosion proof

| Description                      | Catalogue No. |
|----------------------------------|---------------|
| Millivac Mini Vacuum Pump, 115 V | SD1M001V00    |
| Millivac Mini Vacuum Pump, 230 V | XF5423050     |
| Millivac Maxi Vacuum Pump, 230 V | SD1P014M04    |





## Filter Holders

Millipore offers a broad range of filter holders and manifolds.

| Description                                                                                                                                                                                                                           | Diameter (mm) | Catalogue No. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| <b>Hydrosol™ Stainless Filter Holder</b> <ul style="list-style-type: none"> <li>For particulate or biological contamination analysis via vacuum filtration.</li> <li>Includes grounding set for use with flammable liquids</li> </ul> | 47            | XX2004720     |



## Glass Filter Holders

Designed for vacuum filtering liquids for analysis of bacteriological or particulate contamination.

- Includes funnel, fritted base, stopper, and clamp

Also available:

- PTFE-faced base for autoclaving with membrane in place
- Stainless Steel support screen with PTFE gasket base for filtration of aqueous, organic, or corrosive liquids

| Description                                                             | Diameter (mm) | Catalogue No. |
|-------------------------------------------------------------------------|---------------|---------------|
| Glass Filter Holder with Frit Glass Screen Support                      | 47            | XX1004700     |
| Glass Filter Holder, PTFE-coated                                        | 47            | XX1004720     |
| Glass Filter Holder with Stainless Steel Support                        | 47            | XX1004730     |
|                                                                         | 90            | XX1009020     |
| <b>Sterifil® Aseptic System</b><br>Autoclavable polysulfone closed unit | 47            | XX1104700     |
| Vacuum Filtering Flask, 1 L                                             |               | XX1004705     |



## Swinnex® Filter Holders

Use to ultraclean or sterilize small volumes of liquids dispensed by syringe. Connect Swinnex 47 mm filter holder with tubing to pressurized reservoir or automatic filling machine for filtering larger volumes.

| Description                  | Qty/Pk | Catalogue No. |
|------------------------------|--------|---------------|
| Swinnex Filter Holder, 13 mm | 10     | SX0001300     |
| Swinnex Filter Holder, 25 mm | 12     | SX0002500     |
| Swinnex Filter Holder, 47 mm | 8      | SX0004700     |



## Filter Holder Manifolds

- Provide vacuum support for simultaneous filtration of either three or six test samples.
- Use Millipore filter holders fitted with standard No. 8 perforated stoppers
- Manifolds connect to a single vacuum source.
- Each station equipped with separate control valve for independent operation
- Available in stainless steel (SS) or PVC
- SS manifolds can be autoclaved



| Description             | Diameter (mm) | Catalogue No. |
|-------------------------|---------------|---------------|
| 3-Place Manifold PVC    | 47            | XX2604735     |
| 3-Place Stainless Steel | 47            | XX2504735     |
| 6-Place Stainless Steel | 47            | XX2504700     |



## Millicup™ Filter Units

0.45 µm pore size, 300 mL funnel volume

Self-contained, vacuum-driven, disposable bottle top filtration system

- Fast, effective, safe filtration of solvent used in HPLC and other analytical techniques.
- Process volumes of mobile phase or running buffer up to 3L
- Available with Durapore (PVDF) and PTFE (hydrophobic and hydrophilic) membranes

| Description                    | Catalogue No. |
|--------------------------------|---------------|
| With Hydrophilic PVDF membrane | SJHVM4710     |
| With Hydrophilic PTFE membrane | SJLHM4710     |
| With Hydrophobic PTFE membrane | SJFHM4710     |



## Filter Forceps

Handle filters without contaminating or damaging them with our easy-to-clean, stainless steel, flat-tipped forceps.

| Description    | Catalogue No. |
|----------------|---------------|
| Filter forceps | XX6200006P    |



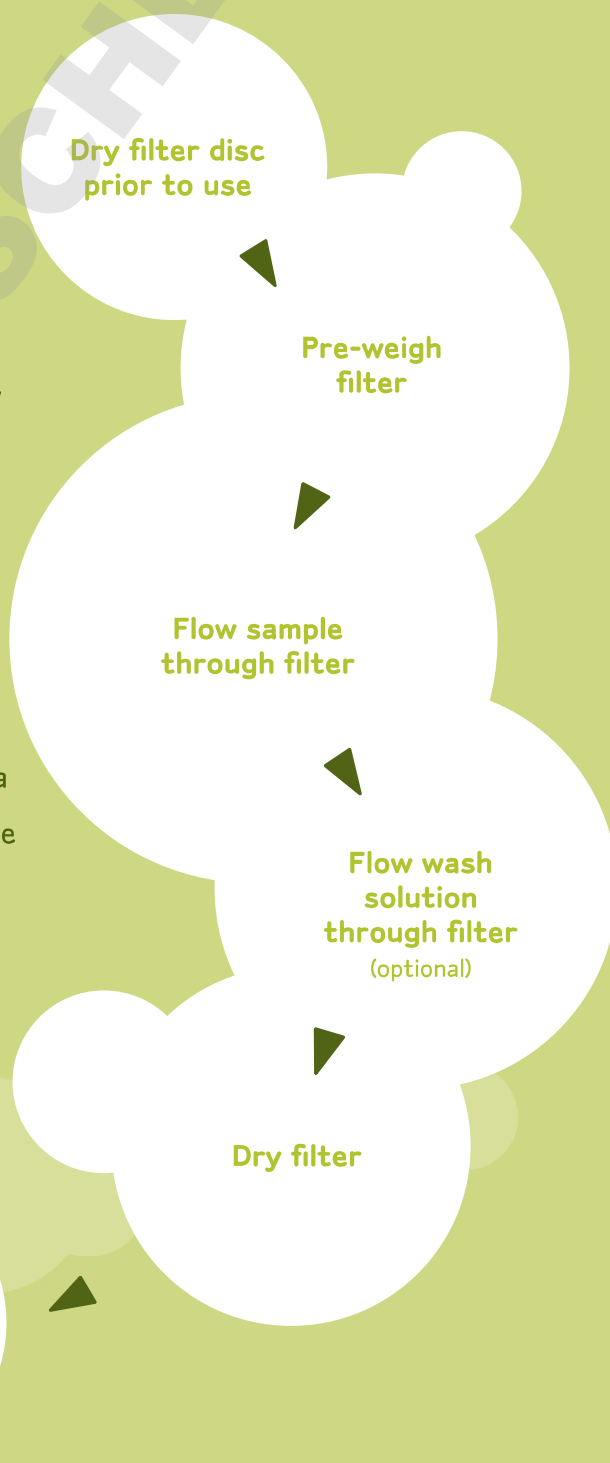
# Analytical Methods

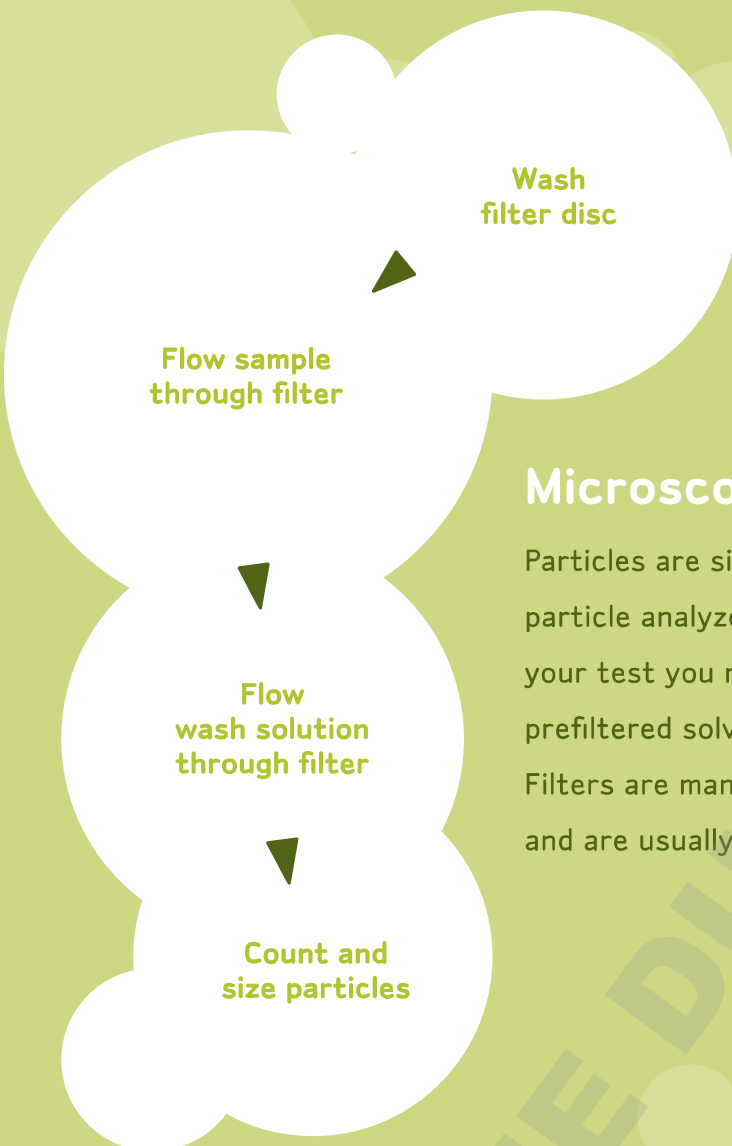
## Metals Analysis

Filters are prepped and analyzed for metals or other target compounds by Inductively Coupled Plasma (ICP) spectroscopy, Atomic Absorption (AA) spectroscopy, and other analytical methods.

## Gravimetric Analysis

Filters are weighed before and after filtration. The initial weight is subtracted from the final weight and a Total Suspended Solids (TSS) number is calculated. Alternatively, Matched Weight Filters may be used. For MCE filters further drying is necessary before preweighing (these filters are hygroscopic and their weight can vary with the humidity). The filter is put on a glass petri dish and placed in a vacuum or regular oven at 80-90C for 15 to 30 minutes or until a constant weight is reached. After drying allow the filter to come to ambient temperature in a desiccator containing calcium chloride before weighing. The same should be done after the sample has been filtered.





Wash  
filter disc

Flow sample  
through filter

Flow  
wash solution  
through filter

Count and  
size particles

## Microscopic Analysis

Particles are sized and counted under a microscope or with a particle analyzer. Depending on the sensitivity level of your test you might need to rinse filters with a compatible prefiltered solvent. Usually this is not necessary. Millipore Filters are manufactured under GMP and ISO 9001 regulations and are usually fine for most applications.

## Alpha Particle Counting

A PTFE filter is inserted into a spectrometer-based continuous air monitor. As air flows through the filter, alpha-particle emitters are trapped on the surface of the filter. Emitted particles collide with and ionize molecules on a solid state detector, and an electronic detector measures the change in the electric potential.

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