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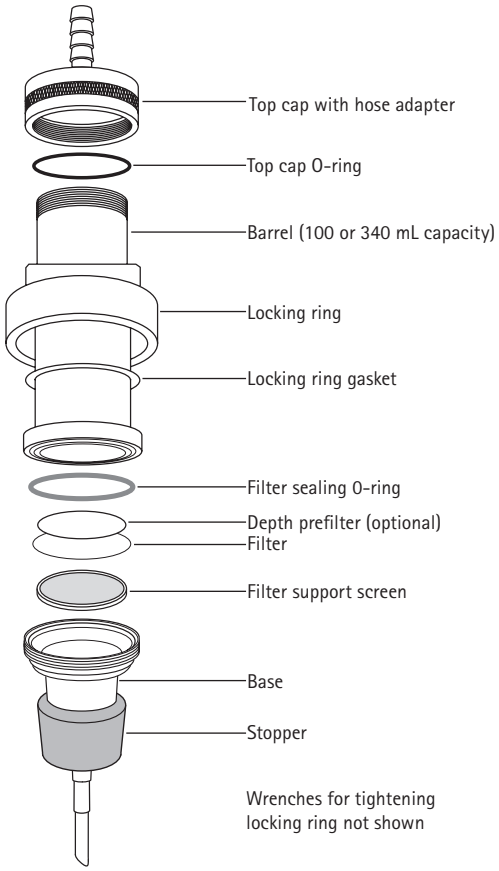
Stainless Steel 47 mm Pressure Filter Holder

Cat. Nos. XX4004700 (100 mL) and XX4004740 (340 mL)

Introduction

The 47 mm Pressure Filter Holder is used to clarify or sterilize small batch volumes of liquid. The cylindrical barrel holds 100 or 340 mL of liquid, depending on the model. The liquid is filtered through a 47 mm disc filter of appropriate pore size by applying external gas pressure via a standard gas cylinder or oil-free vacuum/pressure pump (see Product Ordering Information section for available pumps). An optional depth-type prefilter placed upstream of the membrane filter will prevent premature clogging when processing viscous or particulate-laden liquids. The filter holder can be autoclaved with the filter installed.

Filter Holder Components



Disassembly and Cleaning

Clean the filter holder before using for the first time and after every use.

1. Use the two wrenches supplied if necessary to unscrew the locking ring and release the base. Unscrew the top cap from the upper end of the barrel and slide the locking ring and locking ring gasket off the barrel. Use smooth-tip forceps to remove the top cap O-ring and filter sealing O-ring. To remove the filter sealing O-ring, gently pry it out of the base by inserting the forceps into the small rounded "O-ring pick-out" recess. Tip the filter support screen out of the base onto a clean surface.

   NOTE: If the filter support screen does not readily drop out of its recess, screw the locking ring part way onto the base, then invert the assembly and tap it against the bench top to dislodge the screen.

Disassembly and Cleaning, continued

2. Clean all components thoroughly with a sponge, hot water, and a nonabrasive cleanser. Clean threaded parts, recesses, and orifices with a stiff bristle brush and use a pipe cleaner to remove contaminants from inlet and outlet orifices.

   CAUTION: Never use steel wool or abrasive materials on any part of the filter holder. Take particular care not to scratch the polytetrafluoro-ethylene (PTFE) sealing surface.

3. Rinse all parts thoroughly with hot running water, then rinse several times with cold laboratory-grade water. Rinse new pressure tubing with hot tap water prior to initial use.

4. Allow the components to air dry while disassembled.

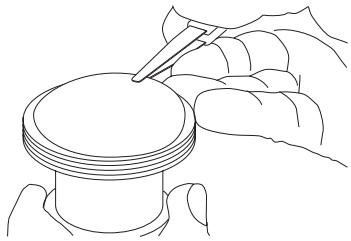
   CAUTION: Do not wipe dry with paper or cloth, as this leaves fibers and lint on the surfaces and also generates electrostatic forces that can attract more dirt. Filtered compressed air can be used to facilitate drying.

Assembly

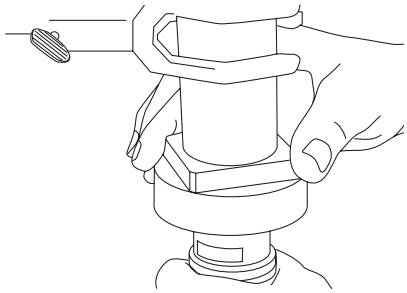
1. Seat the top cap O-ring in the recess in the cap and the filter O-ring in the O-ring groove in the barrel.

2. Slip the locking ring gasket over the threaded end of the barrel, followed by the locking ring. Support the barrel vertically in a ring stand clamp. Position the clamp high enough to place a filtering flask or beaker under the outlet tube, and tighten the clamp enough to prevent the barrel from turning.

3. Seat the filter support screen evenly in the holder base, screen-side up. Holding the base upright, remove a 47 mm diameter filter from its package with smooth-tip forceps, and center the filter evenly on the holder base. If using a depth-type prefilter disc (42 mm diameter), center it exactly on top of the membrane filter. It must be positioned to lie within the sealing O-ring at the bottom of the barrel once the base is secured to the barrel.



4. Lift the locking ring to expose the sealing O-ring in the end of the barrel. Raise the base and filter until it makes contact with the O-ring around the perimeter of the barrel. Then lower the locking ring so that it contacts the base. Hold the base steady and turn the locking ring clockwise until you feel resistance.



5. Grasp the base with the small wrench (it fits into the slots on the base) and tighten the locking ring with the larger wrench. Apply enough force to seal the filter effectively.

   CAUTION: Avoid moving the base, as this may damage the membrane.

Autoclaving

When autoclaving with the filter in place, it is important that the steam be able to access both sides of the filter at the same time, so that there is no differential pressure across the filter, especially while it is hot. To ensure that there are no flow restrictions on the filter holder inlet and outlet, make sure that tubing (if attached) is not kinked. If tubing ends are wrapped, use wrapping material that breathes freely.

Autoclaving, continued

Make sure that any tubing used is autoclavable and can withstand the maximum filtering pressure.

Acceptable tubing: pure gum rubber, silicone rubber, PTFE-lined tubing

Unacceptable tubing: surgical latex, black rubber compounds

1. Make sure that all inner surfaces of the filter holder are completely dry, then assemble the holder with a filter in place. Hand tighten the locking ring.
2. Screw on the top cap, but do not fully tighten.
3. Wrap the exposed ends of the filter holder with lint-free autoclave paper and secure with autoclavable tape or a rubber band. If desired, a length of autoclavable tubing not exceeding 1.5 meters (5 feet) can be attached to the outlet tube.
4. Autoclave the filter holder at 121 °C 1 bar (15 psi) for 25 minutes. Allow the filter holder to cool, then tighten the locking ring using the wrenches provided.

Checking System Integrity (Optional)

A wet membrane filter will not allow gas to pass through the pores at any pressure below a critical value. You can detect a damaged filter or assembly leak with the following test:

1. Attach a short length of flexible tubing to the holder outlet, and place the end of the tubing in a glass beaker or other open receptacle. Place enough water in the beaker to cover the open end of the tubing.
2. Pour a small amount of the liquid you want to filter into the filter holder barrel. Screw down the top cap, connect pressure tubing, and apply low pressure ~0.2 bar (~3 psi). All liquid above the filter will pass through to the beaker, and flow should then stop. If no bubbles are seen, skip to step 4. Bubbles or a rapid continuous flow of gas exiting the outlet tubing indicate inadequate wetting, filter failure, or incomplete sealing.
3. If bubbles are seen, first try rewetting the filter (step 2). If the same thing happens, disassemble the system, inspect membrane for damage, and ensure that there is no dirt, debris, or damage to the O-ring or sealing surface. Install a new filter and repeat loading, autoclaving, and system integrity steps 1 and 2.
4. Slowly increase pressure, in 0.3 bar (5 psi) increments to approximately 80% of the bubble point pressure for the installed filter. Enter the family name (*Durapore, MF-Millipore, Fluoropore,* etc. + *membrane ilters*) in the search box. Continue to increase pressure in 0.3 bar (5 psi) increments, pausing 10–15 seconds after each increase. The test is successful if you reach or exceed the typical bubble point. **NOTE:** If the holder contains multiple filters (as in a serial filtration), or a prefilter in addition to the membrane filter, gas trapped against the wet membrane after a bubble point test can produce an air-lock that will restrict flow. You can overcome this by raising the filtering pressure over the bubble point of the smallest pore size filter used.

Filtering the Sample

NOTE: If the system has been autoclaved, use aseptic technique.

1. Place the assembled filter holder on a ring stand and place a suitable receiving vessel under the filter holder outlet to collect the filtrate.

   CAUTION: When using the silicone stopper attached to the base to seat the filter holder in a flask receiving vessel, air must be allowed escape from the flask during filtration.
2. Remove the top cap, if attached, and pour the sample into the holder barrel, Screw the top cap down tightly. Attach pressure tubing to the top cap tubing adapter using a hose clamp, and apply pressure from an inert gas or filtered air supply to filter the sample. Do not exceed the maximum recommended pressure of 6.9 bar (100 psi).
3. When filtration is complete, relieve internal pressure in the holder with the regulator valve on the pressure source. If the regulator valve does not allow for such venting, do not attempt to remove the pressure hose connection. Instead, slowly unscrew the top cap until you hear the sound of gas escaping. When the sound ceases, remove the pressure tubing and open the holder.

Specifications

Maximum pressure	6.9 bar (100 psi) inlet and differential
Filter diameter	47 mm
Prefilter diameter	42 mm (thick depth prefilter)
Effective filter area	14.3 cm^2 (2.2 in^2)
Capacity	100 mL (cat. no. XX4004700) and 340 mL (cat. no. XX4004740)
Connections	Inlet: 3/8 in. tubing adapter Outlet: accepts 1/4 in. to 3/8 in. inner diameter flexible tubing

Specifications, continued

Dimensions	Diameter (locking ring): 6.9 cm (2.7 in.) Height (XX4004700): 28.1 cm (11.1 in.) (XX4004740): 52.5 cm (20.7 in.)
Weight	XX4004700: 1.1 kg (2.3 lb) XX4004740: 1.2 kg (2.7 lb)
Materials of construction	Top cap, barrel, filter support screen, base: stainless steel Locking ring and wrenches: anodized aluminum Filter O-ring and locking ring gasket: PTFE Top cap O-ring: fluoroelastomer Stopper: silicone

Statement Regarding Compliance with the Pressure Equipment Directive, 97/23/EC

EMD Millipore Corporation certifies that this product complies with the European Pressure Equipment Directive, 97/23/EC of 29 May 1997. This product is classified under Article 3 § 3 of the Pressure Equipment Directive. It has been designed and manufactured in accordance with sound engineering practices to ensure safe use. The product is accompanied by user instructions and bears markings to permit identification of EMD Millipore Corporation as the manufacturer or authorized representative of this product within the European Community. In compliance with Article 3 § 3 of the Pressure Equipment Directive, this product does not bear the CE mark.

Product Ordering Information

This section lists catalogue numbers for the Stainless Steel 47 mm Pressure Filter Holder, spare parts, and accessories. See the Technical Assistance section for contact information.

Description	Qty	Catalogue Number
Stainless Steel In-line Filter Holder, 100 mL	1	XX4004700
Stainless Steel In-line Filter Holder, 340 mL	1	XX4004740
Top cap with hose adapter	1	000205
Locking ring gasket	5	XX4004714
Filter sealing O-ring	5	XX4004716
Filter support screen	1	XX4004704
Silicone stopper, 9.5 mm (3/8 in.) hole	5	XX2004718
Replacement parts kit, 47 mm holder (includes top cap O-rings [5], locking ring gaskets [5], filter sealing O-rings [5])	1	XX40047RK
Accessories		
Filter forceps, stainless steel, blunt end (3/pk)	1	XX6200006P
PVC tubing (not autoclavable), 9.5 mm (3/8 in.) inner diameter × 3 meters (10 ft), with 2 stainless steel clamps	1	XX6700034
Vacuum/pressure pump, 115 V, 60 Hz	1	WP6111560
Vacuum/pressure pump, 230 V, 50 Hz	1	WP6122050
Vacuum/pressure pump, 100 V, 50/60 Hz	1	WP6110060

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