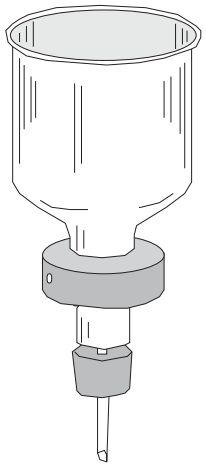
User Guide

Hydrosol® Stainless 47 mm Filter Holder

XX2004720



Intended Use

The Hydrosol® Stainless 47 mm Filter Holder enables you to vacuum-filter flammable and non-flammable liquids to analyze particulate or biological contamination. It comes with a grounding wire to filter flammable liquids with a vacuum. (Refer to "Accessories" at the end of this document for details on additional parts you can order to vacuum-filter liquids.)

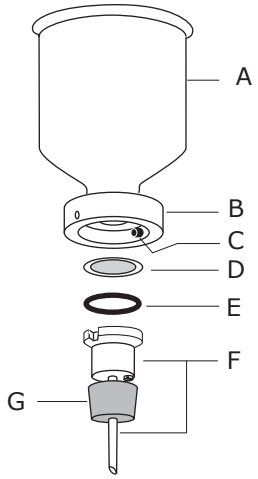
⚠ **WARNING:** Filtration of flammable liquids can generate enough static electricity to cause a fire or explosion. Explicitly follow the steps in this document to prevent dangerous reactions.

For details on publications that describe analytical procedures not included in this insert, contact SigmaAldrich.com/techservice.

Hydrosol® Stainless 47 mm Filter Holder Parts

- Hydrosol® Stainless 47 mm filter holder
- Grounding wire
- Hydrosol® Stainless 47 mm Filter Holder manual

Diagram of the Filter Holder



A Funnel and locking ring assembly

B Locking ring

C Nylon lockwheels

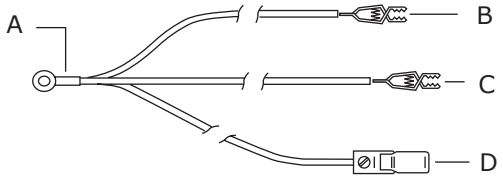
D Filter support screen

E Support screen gasket

F Base with grounding screw

G Silicone stopper

Diagram of the Grounding Wire



A Grounding ring terminal to base

B Wire with clip to funnel, 18 in.

C Wire with clip to ground, 48 in.

D Wire with clamp to manifold tulip, 10 in.

Overview on How to Use the Hydrosol® Stainless 47 mm Filter Holder

1. Insert a filter into the Hydrosol® filter holder. (You may also need to insert a prefilter.)
2. Connect the filter holder to a standard vacuum source or a dry-air vacuum source.

   Note: If planning to filter non-flammable liquids, skip to step 4.
3. Prepare the filter holder for filtering flammable liquids and perform an electrical continuity check.
4. Filter the non-flammable or flammable liquids.
5. Clean and store the filter holder.

Inserting a Filter into Filter Holder

Make sure to have the following materials since they are not included with this product:

- Filter holder manifold (optional)
- Side-arm filtering flask (optional)
- Filter, 47 mm diameter
- Prefilter disc, 35 mm diameter (optional)

Note: You need to use a filter holder manifold or a side-arm filtering flask to perform the steps in this section.

1. Locate the Hydrosol® filter holder base and insert it into the silicone stopper.
2. Grasp the outside of the holder base with one hand and the locking ring of the funnel with the other. Then rotate the locking ring a 1/4-turn to the left and lift off the funnel.
3. Rest the funnel assembly on its side on a clean, flat surface.
4.

5. Seat the holder base and stopper assembly firmly into the neck of the side-arm filtering flask, or in any position on the manifold.

   Note: If using a filter holder manifold, seal off any unused positions with silicone stoppers or with independent valves.

6. Make sure the filter support screen and its underlying gasket are in the top of the holder base (with the screen flat and flush with the holder base top). Then place a filter with a 47 mm diameter in the center of the filter support screen with smooth-tip forceps.

   Note: For statistical counting procedures, make sure the gridded side of the filter faces up.

7. Position the funnel on the holder base so that the nylon lockwheels lock into the locking cams (on the underside of the holder base). Do not touch the inside of the funnel because it will disturb the filter.

8. Hold the funnel with one hand firmly and turn the locking ring a 1/4-turn to the right until it's tight. This secures the funnel to the holder base.

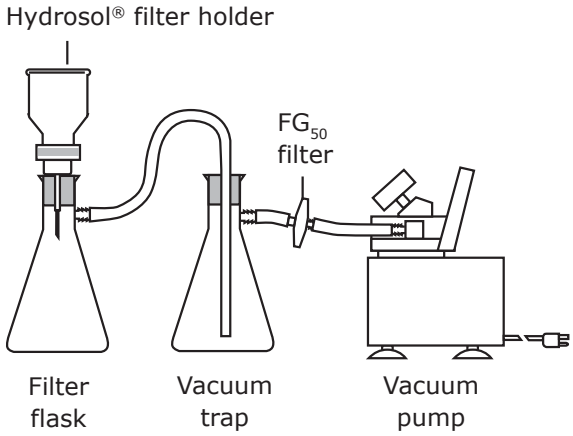
9. Place a depth prefilter disc with a 35 mm diameter through the top of the funnel, centering it on top of the 47 mm filter.

Connecting the Filter Holder to a Vacuum Source

After assembling the holder, make sure to have the following items to connect the filter holder to a vacuum source since they are not included with this product:

- Three silicone vacuum hoses
- Side-arm filtering flask with a vented silicone stopper
- Millex®-FG_{50} filter
- Vacuum/pressure pump or vacuum source

1. Attach one end of the silicone vacuum hose to the side-arm of the filtering flask that supports the filter holder assembly or to the vacuum connection of the manifold.
2. Locate another side-arm filtering flask with a vented stopper. Then insert the end of the silicone vacuum hose in the hole of the stopper.
3. Attach a second silicone vacuum hose to the side-arm of the second filtering flask. Then attach a Millex®-FG_{50} filter to the open end of the hose.
4. Attach the third silicone vacuum hose to the open end of the Millex®-FG_{50} filter. Then attach the open end of the this hose to the vacuum/pressure pump or vacuum source. The assembly should look like this:



5. Continue to "Filtering Non-Flammable or Flammable Liquids" if you plan to filter non-flammable liquids. If planning to filter flammable liquids, see "Preparing the Filter Holder to Filter Flammable Liquids."

Preparing the Filter Holder to Filter Flammable Liquids

This section describes how to prepare the filter holder for flammable liquids and perform an electrical continuity check to verify the grounding system. Only follow these steps if you need to filter flammable liquids.

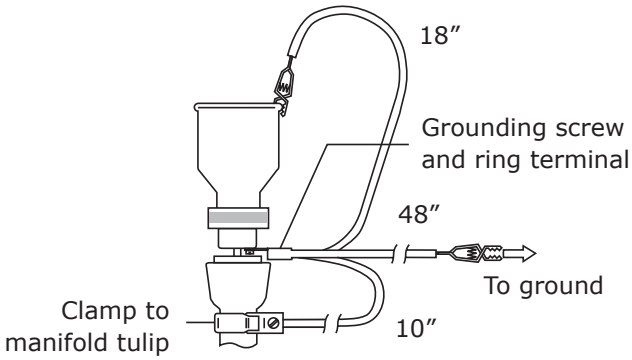
⚠ **Warning:** Follow the steps in this section exactly as stated to avoid creating a fire or explosion when filtering the flammable liquid sample.

1. Locate the grounding wire that came with the filter holder and a flathead screwdriver.
2. Remove the grounding screw on the holder base with the flathead screwdriver and set it aside.
3. Locate the ring terminal hole at the end of the grounding wire. Then line it up with the grounding screw hole on the holder base.
4. Place the grounding screw through the wire's ring terminal hole and back into place on the holder base. Then tighten the screw with the flathead screwdriver to hold the wire on the base.

   Note: Do not over-tighten the grounding screw.

5. Secure the clip located at the other end of the ring terminal to an appropriate grounding path as defined by NFPA 70-250.

6. Squeeze the clip located at the end of the 18 in. wire and clip it onto the funnel lip. Otherwise, skip to step 8 if using a sidearm filtering flask. If using a manifold to filter your flammable liquid, continue to the next step.
7. For a filter holder manifold:
   Squeeze the clip located at the end of the 10-in. wire and clip it onto the manifold tulip. This is what the assembly should look like with a manifold:



8. For a side-arm filtering flask:
   The assembly should look similar to the manifold illustration above, except that the 10-inch wire hangs free.
9. Perform an electrical continuity check to determine electrical potential along the path of flammable liquid travel and between filter holder and ground.
10. Continue to “Filtering Non-Flammable or Flammable Liquids.”

Filtering Non-Flammable or Flammable Liquids

After connecting the filter holder to the appropriate vacuum source (and prepare the filter holder to filter flammable liquids, if necessary), follow the steps in this section to filter non-flammable or flammable liquids.

⚠ **Warning:** Work under a hood (or another ventilation system) while filtering flammable liquids to prevent accumulation of ignitable vapor and air mixtures. Ventilation systems, including fume hoods, must be designed in accordance with the National Fire Protection Association (NFPA) code.

1. Pour liquid sample into the 650 mL funnel.

   Note: Do overfill the funnel or it will overflow.
2. Turn on the vacuum source.
3. Rinse down the funnel walls with approximately 30 mL of Milli-Q® water when the sample level lowers to the funnel neck. This flushes residue and secures a uniform contaminant distribution on the filter surface for statistical counting.

   Note: In microbiological tests, the rinse fluid must be sterile and buffered. You can use the rinse fluid from the Solvent Filtering Dispenser.
4. Shut off the vacuum as soon as all of the flushing fluid passes through the filter.
5. Continue to “Removing Your Filter from the Holder.”

Removing the Filter from the Holder

After filtering the non-flammable or flammable liquids, follow these steps to remove the filter from the holder for analytical procedures:

1. Gently rock the holder back and forth to break the stopper seal and release the filter flask vacuum.
2. Seat and secure the holder so it doesn’t fall off.
3. Dispose of the sample liquid appropriately.
4. Grasp the outside of the holder base with one hand and the locking ring with the other.
5. Rotate the locking ring a 1/4-turn to the left and lift off the funnel.
6. Rest the funnel assembly on its side on a clean surface.

   Caution: Do not stand the funnel assembly upright because it soils the funnel rim and the sealing edge of the funnel outlet.
7. Transfer the filter to a clean petri dish with smooth-tip forceps for visual particle counting. Or transfer it to a prepared media pad or agar plate in a sterile petri dish for microbial contaminant culturing.

   Note: Culture the prefilter for a microbiological test. Otherwise, discard it.

Disassembling and Cleaning the Filter Support Screen and Gasket

After removing the filter from the filter holder, follow these steps to disassemble and clean the filter support screen and gasket, and the locking ring gasket:

1. Hold the holder base upside down and at a slight tilt.
2. Strike the edge of the holder base sharply against a hard, clean surface. The screen and gasket are now loose enough to remove them with smooth-tip forceps.

   Caution: Never use a sharp or pointed instrument to pry off the support screen or it will damage the screen's mesh.
3. Remove any residue on the gasket with a stiff, bristled brush only.

   Caution: Do not use a brush on the filter support screen because it can damage the screen's mesh. Never use steel wool or abrasive materials to clean the screen and gasket because it will damage them.
4. Clean the inside of the holder outlet tube with a swab soaked in a detergent solution.
5. Flush out the area under the top of the locking ring with clean water. This area accumulates residue easily. Then let the area air-dry.

   Caution: Do not wipe the locking ring with paper towels or a cloth or you will leave traces of lint. Lint can prevent sterile filtration in the future.
6. Rinse the remaining parts and air-dry them.

Cleaning the Locking Gasket

Over an extended period of time, or after filtering heavily contaminated liquids, the locking ring gasket may accumulate dirt that interferes with the holder's sealing ability. To remove and clean the gasket:

1. Invert the funnel and the locking ring assembly.

   Caution: Do not stand the funnel assembly upright because it soils the funnel rim and the sealing edge of the funnel outlet.
2. Slightly loosen the two screws in the locking ring.
3. Remove the nylon lockwheels from the locking ring with the 0.05 in. Allen wrench that comes with the kit and a Philips screwdriver that you provide. Then set the lockwheels aside on a clean surface. Notice that the three screws in the sealing collar of the funnel are now accessible.
4. Loosen the three screws with the 5/64-in. Allen wrench, that comes with your kit, until exposing approximately a quarter of each screw.
5. Lift the sealing collar off of the funnel and set it aside on a clean surface.
6. Remove the locking ring and locking gasket and inspect them closely for any damage or dirt.
7. Thoroughly clean the inner surface of the locking ring and locking gasket with a detergent solvent. Replace the locking ring gasket if it is damaged or distorted.

Reassembling the Holder

After disassembling and cleaning the support screen and gasket, and the locking gasket, follow these steps to reassemble the holder:

1. Place the support screen gasket into the top of the holder base.
2. Put the support screen on top of the support screen gasket.
3. Position the clean locking gasket inside the locking ring.
4. Slip the locking ring containing the locking gasket over the end of the funnel (open side up).
5. Place the sealing collar and tighten the three screws with the 5/64-in. Allen wrench. The funnel will project approximately 1/16-in. beyond the face of the collar if properly positioned. Repeat this step until the funnel is properly positioned.

   Note: Make sure the screws rest in the center of groove of the funnel for proper positioning.
6. Place the lockwheels inside the locking ring and secure them with a Philips screwdriver.

   Note: Make sure the lockwheels are smooth so they can lock into the locking cams on the underside of the holder base.
7. Tighten the two screws on the outside of the locking ring with the 0.05 in. Allen wrench to keep the lockwheel holding screws from loosening.

   Note: Rotate the wheels to new positions or replace them if a flat spot develops in either of the lockwheels.

Sterilizing and Storing the Holder

Caution: Do not use autoclave steam-containing amines; they contaminate the sample liquids used in the future.

1. Sterilize the holder and holder base separately with dry heat or autoclave for 15 to 20 minutes at 121 °C. Repeat.
2. Store the holder and holder base at room temperature in a dry place for future use.

Specifications

Filter Size	47 mm diameter
Filter Area	~ 9.6 cm or 100 grid squares
Prefilter Size	35 mm diameter
Funnel Capacity	650 mL
Pressures	Vacuum
Dimensions	114 mm diameter × 229 mm height

Product Ordering

Products may be purchased online at SigmaAldrich.com.

Replacement Parts

Parts	Cat. No.
Funnel and locking ring assembly	XX2004704
Locking ring gasket, Teflon® (5/pk)	XX4004714
Locking ring	XX2004701
Nylon lockwheels (with wrench)	XX2004707
Filter support screen, stainless	XX2004708
Support screen gasket, Teflon® (25/pk)	XX2004703
Holder base with screen, gasket, and stopper	XX2004702
Silicone stopper, #8 3/8 inch hole (5/pk)	XX2004718
Grounding wire assembly	P35009
Replacement kit:	XX20047RK
One aluminum locking ring	
Two lockwheels	
One Allen wrench	
One Teflon® locking ring gasket	
One Teflon® screen gasket	

Accessories

Parts	Cat. No.
Funnel and locking ring assembly, 100 mL	XX6300121
Vacuum filtering flask, 1.0 L	XX1004705
Millex®-FG_{50}, 50 mm	SLFG05010
Vacuum/pressure pump, 115V, 60 Hz	XX5500000
Vacuum/pressure pump, 220V, 50 Hz	XX5522050
Vacuum/pressure pump, 100V, 50/60 Hz	XX5510000
Hydrosol® filter holder manifold, 6-place	XX2504700
Hydrosol® filter holder manifold, 3-place	XX2504735
PVC filter holder manifold, 3-place	XX2604735
Vacuum hose silicone, 1.4 m	XX7100004
Filter forceps, stainless, smooth-tip	XX6200006

Notice

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