

Porex[®] Cartridge Filters

Cartridge Installation

- Cut the bottom end of the sealed plastic bag, exposing the O-ring at the end of the cartridge, leaving the bag on the element for protection while handling and installing. Be careful not to damage or cut the O-ring or filter cartridge.
- Lubricate the O-rings with the process fluid, water, or other appropriate liquid (submerging is best).
- Holding the cartridge as close to the cartridge fitting as practical, insert into base cup with slight twisting motion. Rotate the element a few degrees, if 226, to engage the retaining tabs. Please note that excessive twisting of the cartridge may cause damage.
- Remove protective bag once filter is fitted into the housing and then assemble housing based on manufacturer's protocol.

Cartridge Sterilization Procedure

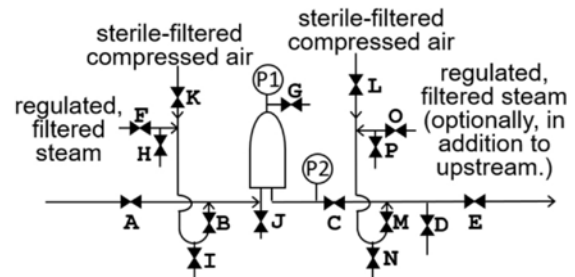
- Cartridges should be sterilized based on housing manufacturer's protocol.
- Differences in filter housings and configurations may affect sterilization process. The steam in place process needs to be validated by the end user.

SIP Sterilization Procedure

A general SIP sterilization guideline is as below:

- We recommend in situ steam sterilization at 125°C for 1 hour for a maximum of 20 cycles, with differential pressure across the filter maintained at less than 3psi for each sterilization cycle.
- Flush PES membrane filter with water before steaming.
- Use saturated steam.
- When planning an SIP strategy, consider the following
 - a) hydrophilic PES membrane filters must not be allowed to dry out but must remain wet during steaming or they can lose their ability to be integrity tested with water
 - b) a water-wetted membrane filter will transmit steam slowly.

- Do not steam through the filters to downstream equipment. These PES membrane filters can be steamed via a double block method, wherein the filters and downstream equipment are steamed separately. Referring to the SIP schematic, the section between valves C and E would be steamed 2x in the double block method. The filter assembly would be steamed through to valve E, while downstream equipment would be steamed separately back to valve C.



- Alternative methods to the double block method are possible such as introducing steam to both upstream and downstream side of the filter.
- These filters should be steamed in the forward direction – do not exceed 5 psid differential pressure. Inadvertent steam flow in the reverse direction should not exceed 3 psid.
- Sterile-filtered air ballast/air purge is a requisite step. At the conclusion of SIP, as steam is being turned-off, introduce sterile-filtered compressed air upstream of the filter at 3-5 psig above steam pressure to prevent reverse pressurization damage, to cool the system, and to assist water drainage, but do not exceed 5 psid across the filter – continue air flow until the system reaches ambient temperature.
- SIP schematic is shown for general guidance and discussion purposes. Thermocouples are not shown but should be employed as appropriate. For specific valve sequence recommendations, contact your Porex representative.

Filter Wetting Procedure

- Open the upstream vent valve to allow air inside the filter housing to escape freely.
- Ensure outlet valve is closed. Fill the filter housing with clean, filtered water at 15°-25 °C until it flows out from the vent valve; at which time the vent may be closed.
- Open outlet valve and rinse at a flow of 7.6-11.4 LPM per 10-inch cartridge (or 12.2-20.3 LPM/m² of filter surface area) for 10-15 minutes.
- Below is table for recommended flush conditions:

Filter Size	Flush Volume (L)	Flow Rate (LPM)	Time (min)
10"	76 to 170	7.6 to 11.4	10 to 15
5"	34 to 86	3.4 to 5.7	10 to 15

Integrity Testing

We recommend an integrity test before each process run to ensure the integrity and function of the filter cartridges. Cartridges and water must be at ambient temperature to perform the integrity test.

Bubble Point Testing

- Wet cartridges using filter wetting procedure.
- Open the outlet valve and using 3-4 psi/0.25 bar clean, oil and moisture-free, compressed air, apply pressure to the filter cartridge housing in the direction of filtration flow for 1 minute. This will allow residual water to drain.
- Connect the housing outlet to a tube extending into an open-top container partially filled with water, ensuring the tube end is held below the surface of the water.
- Slowly increase the inlet pressure while watching for air bubbles in the open top container.
- The bubble point is the pressure at which a surge of bubbles escapes from the tube in the open top container.

Table 1: Minimum bubble point values for filter cartridges

Filter Cartridge	Minimum Bubble Point (psi/bar)
SRC (Double Layer 0.2/0.2um)	49/3.4
SCW (Double Layer 0.45/0.2um)	49/3.4
BHS (Single Layer 0.2um)	49/3.4
BTG (Single Layer 0.45um)	38/2.6
BRH (Single Layer 0.8um)	16/1.1

- The minimum bubble point values are listed below:
- In the event you are unable to reach the minimum bubble point as indicated in Table 1, repeat filter wetting procedure and bubble point test, as most bubble point failures are due to incomplete wetting of the filters.

Diffusive Flow Test

- Wet cartridges using filter wetting procedure.
- Open the outlet valve and using 3-4 psi/0.25 bar clean, oil and moisture-free, compressed air, apply pressure to the filter cartridge housing in the direction of filtration flow for 1 minute. This will allow residual water to drain.
- Connect suitable air flow measuring device to the housing outlet.
- Slowly increase pressure to the filter cartridge housing up to the appropriate test pressure as listed in Table 2.
- Upon reaching test pressure, wait 2 minutes for system to stabilize, ensuring pressure is maintained as listed in Table 2.
- After 2 minutes, verify if air diffusion flow rate (mL/min) for the system meets the acceptable limits as listed in Table 2.
- If the air diffusion flow rate exceeds the prescribed value, repeat wetting and test procedure. Most failures are due to incomplete wetting of the filters.
- If the air diffusion flow fails the second time, the filter cartridge may be defective and should not be used.

Table 2: Maximum air diffusion rate for filter cartridges

Filter Cartridge	Size	Max Air Diffusion Rate
SRC (Double Layer 0.2/0.2um)	10"	16 mL/min @ 40psig
	5"	7.15 mL/min @ 40psig
SCW (Double Layer 0.45/0.2um)	10"	26 mL/min @ 40psig
	5"	11.6 mL/min @ 40psig
BHS (Single Layer 0.2um)	10"	100 mL/min @ 40psig
	5"	45 mL/min @ 40psig
BTG (Single Layer 0.45um)	10"	100 mL/min @ 30psig
	5"	45 mL/min @ 30psig



For technical information including performance guide, instructions for use, and certificate of quality, please visit our website.