



Vinosart®BE

Directions for Use

1. Installing Vinosart Filter Cartridges in Housings

- Cut open the bottom end of the plastic bag (at the O-ring end of the cartridge).
- Leave the bag on the cartridge to protect it while installing it in the housing base. Remove bag afterwards.
- Wet the O-rings with water. For best results, submerge the O-rings.
- To install the cartridge, ease the O-ring end into the housing base. While doing so, hold the cartridge at both ends.

2. Rinsing/Wetting (with Prefiltered Water in the Direction of Filtration)

- First open the vent valve on the upstream pressure gauge.
- Fill the filter cartridge housing with water until water escapes from the vent valve. If necessary, slightly close the valve on the downstream (filtrate) side.
- Open the filtrate drain valve.
- Rinse at a low flow rate (approx. 600 l/hr per 30" cartridge) for 5 min.

3. Sterilization (in the Direction of Filtration)

- Drain the cartridge housing. The time it takes to drain the housing can be reduced by applying pressure using oil and water-free compressed air (max. $\Delta p = 0.3$ bar; ≈ 4 psi); water drains out on the downstream (filtrate) side through the sampling valve or the runoff valve.
- Slightly open all valves on the cartridge housing.
- Sterilize the completely prewetted filter cartridges.
 - a) Steam:
 - Low-pressure steam: 1 bar max. (15 psi)
 - Sterilization time: 30 min. after steam escapes from the filter outlet;
 - $\Delta p = 0.5$ bar (7 psi)
 - To prevent vacuum caused by condensation in the housing, which may lead to implosion and thus damage the cartridges, apply 0.5 bar of compressed air to the closed housing.
 - b) Hot water
 - Temperature: 85 to 90 °C
 - Sterilization time: 30 min. after the sterilization temperature has been attained at the outlet. Flow rate: 600 l/hr per 30" cartridge.

- Close all valves immediately before the end of the sterilization procedure (valves of the main piping at the inlet and outlet, runoff valve, test valve and sampling valve) and shut off the upstream/hot water supply line.
- When the installation has been sterilized by hot water, first pump in compressed air at a pressure of 0.3 bar to drain the housing via the runoff valve and then increase the pressure inside the housing to 0.5 bar.

3.1 Post Sterilization

- If the filtration system is to be started up immediately, slowly flush the housing with cold water. Vent the housing while filling it with cold water; however, maintain a pressure of at least 0.2 bar inside the housing. As soon as water flows out of the vent valve, close the valve and flush the system with cold water (Δp of 0.3 bar max.).
- If filtration will not start immediately, see steps 7, 8.

4. Integrity Testing

We recommend performing an integrity test before and after each filling operation to ensure that the filter cartridges will function correctly.

- Please ensure that the housing and the filter cartridges have cooled down to the ambient temperature before performing an integrity test.
- 4.1 Manual Integrity Testing**
 - Apply pressure to the filter cartridge housing in the direction of filtration using 0.3 bar or 4 psi of compressed air or nitrogen, for example. In the process, the pressure causes the water inside the filter cartridge housing to be drained from the test valve. Open the drain valve to drain off any residual water from this valve.
 - Slowly apply pressure to the filter cartridge housing up to a test pressure of 1.1 bar (~ 16 psi) (0.45 μm) or 0.6 bar (~ 9 psi) (0.65 μm) and then close the gas inlet valve. Wait 5 minutes for the stabilization phase to be completed. If necessary, you may need to readjust the pressure to the amount specified above.
 - Shut off the pressure supply.
 - The integrity test then takes 10 minutes.
 - Perform the integrity test at 20°C \pm 5°C on water-wetted cartridges.

- Calculate the maximum allowable pressure drop using the following formula:

$$\Delta p = \frac{\text{Max.D} \cdot n \cdot h \cdot t \cdot p_{\text{atm}}}{V_{\text{in}}}$$

- Δp : Pressure drop (mbar)
- Max.D: Max. allowable diffusion = 15 ml/10" cartridge · min
- n: Number of cartridges
- h: Height of the cartridges
- t: Test time
- p_{atm} : Atmospheric pressure (1000 mbar)
- V_{in} : Inlet volume (ml)

Standard Cartridges	Pore Size	Test Pressure	Maximum Diffusion per 10" element
520XX06F1BE	0.45 μm	1.1 bar (16 psi)	15 ml/min
520XX05F1BE	0.65 μm	0.6 bar (9 psi)	15 ml/min

Once the maximum allowable pressure drop is calculated by the above method, mbar may be converted to psi by the following conversion: 1000 mbar = 14.5 psi

- Determining Inlet (Upstream) Volume (V_{in}) - Manual integrity testing using the maximum allowable pressure drop method requires the accurate determination of inlet volume. Once this inlet volume is determined it may be used for all tests performed on the same housing provided no modifications have been made.

Inlet Volume is most easily determined using a Sartocheck automated integrity test instrument. Contact your local Sartorius representative for assistance in determining inlet volume.

- The upstream connections, such as the valves and pressure gauge, must be completely leak-tight to perform the integrity test. If the filter cartridge system passes the integrity test, the filter cartridges are guaranteed to be in perfect condition for filtration. Should the pressure reading on the pressure gauge drop by more than the allowable amount during the test time, either the filter cartridge system leaks or the filter cartridges have not been sufficiently flushed or wetted. In this case, shut off the pressure supply, vent the filter cartridge housing and rewet the cartridges as described in step 2.

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- If the filter cartridge system fails the integrity test again, please observe the following:
 - System leakage can occur at the inlet or outlet valve, at the pressure gauge/venting unit or at the O-ring of the housing bell. Please check these areas with leakage spray when the cartridge housing is pressurized.
 - Make sure that the cartridges are correctly installed; sometimes a gasket may have become displaced from the adapter groove during installation of a cartridge.
 - If you cannot find the cause of such leakage, a defective filter cartridge could be the problem. To clearly identify defective cartridges, test them in a single-cartridge housing in the manner described above.

4.2 Automatic Integrity Testing

- For convenient integrity testing and for automatic recording and printouts of the test results, we recommend using a Sartochek Integrity Tester. For more information on this integrity tester, please consult your local Sartorius representative.
- Should the pressure drop limit for two consecutive integrity tests show a significant increase within the allowable limits (i.e., an increase in the measured value by at least 50% compared to the previous measurement), either system leakage or defects in individual cartridges could be the cause. In this case, rewet the cartridges as described in step 2 and repeat the test. If the results are substantiated, we recommend determining the cause of the increased pressure drop (check for system leakage or individually test the cartridges).

5. Filtration

Once the cartridge housing has passed the integrity test, it is ready to use for filtration. To utilize the entire filter area, completely vent the housing at the beginning of filtration by slightly opening the vent valve. Venting is complete when water flows from the valve.

6. Regenerating the Filter Cartridges

- You must regenerate the filter cartridges on each day of filtration.
- In any case, you should flush the filter cartridges with water whenever the drop in pressure on the cartridges exceeds the initial differential pressure by more than 0.5 bar (~7 psi).
- The filter cartridges may only be flushed in the direction of filtration.
- Clean the cartridges with cold water first, then with hot water (60– 80°C).
- The flow rate for flushing should be 1–2 times greater than the filtration flow rate.

7. Downtimes up to 6 Weeks

- Flush the filter cartridges clean using prefiltered cold or hot water.
- Sterilize as described in step 3.
- Close all valves and leave the filter cartridge housing pressurized at 0.5–1 bar (~7 psi–15 psi) in this condition until startup of the next filtration run.

8. Downtimes Longer Than 6 Weeks

- Flush the filter cartridges clean using prefiltered cold or hot water.
- Either fill the filter cartridge housing with a preservative or store the filter cartridges outside the housing in a container that is filled with a liquid preservative (to prevent bacterial growth). Use, for example, an aqueous SO₂ solution at a recommended concentration of 2%.

9. Maximum Pressure Resistance

Differential pressure:
5 bar (73 psi) max./25 °C,
2 bar (29 psi) max./80 °C

10. Changing the Filter Cartridges

The filter cartridges are spent and must be changed in the following cases:

- If the maximum differential pressure has been attained or the flow rate cannot be improved even after regeneration.
- The differential pressure Δp exceeds 5 bar (~73 psi).

11. Applications Support

Your local Sartorius field engineers and our Food & Beverage Unit will be happy to answer any special questions that you may have.

Telephone: 800-368-7178

Fax: 631-254-4253

12. Return of Used Filter Cartridges

If you wish to return used filter cartridges for testing at Sartorius, make sure that you sterilize or decontaminate the cartridges first before packaging them for shipment. You must enclose a completed Return Shipment Form in every cartridge shipment. This form is available from your local Sartorius representative. Any return shipment not accompanied by this completed form will be rejected.

13. Liability

Sartorius shall not assume any liability for defects or damage that result from improper handling of Vinosart BE filter cartridges. In particular, if the user does not follow these Directions for Use, the filter cartridges will be considered to have been improperly handled. In the interest of the further development of Sartorius products, we reserve the right to make changes to the specifications of these products without notice.

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