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# Millipore Filter Tester

**Part No. 145-00-10**

## Instruction Manual

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## ***Intro***

Much information about an injection water can be determined from membrane filtration tests. These tests are most valuable when trying to determine plugging tendencies of an injection water and in the identification of solids on the filter which causes plugging of the formation.

Membrane filter tests can be used to pinpoint the exact sources of trouble within a system. Once the problem has been alleviated, a membrane filter can be used for verification purposes. If the problem can not be resolved by mechanical means, chemical treatment will be necessary. The membrane filter can be used to determine the effectiveness of the chemical treatment employed. Routine filtration tests can be performed to avert a problem in an injection system which might go undetected until the problem became so severe that it would become necessary to shut down the injection program.

# Operation

1. Check the wing nuts on the top of the Lucite container to insure that the lid is on tight without the regulator assembly.
2. Attach the 3/8" Tygon tubing from the water source to the toggle valve under the Lucite container.
3. Fill the Lucite container with water to within 1/2" from top lid. Close the toggle valve.
4. Unscrew the lower portion of the blue Millipore filter holder and attach the 1/4" Tygon tubing to it. Insert the membrane filter on the flat, white surface. Screw the lower portion of the filter holder into its original place and tighten 1/4 turn.
5. Tilt the Lucite container to one side. Open the toggle valve, which is between the blue filter holder and the bottom of the Lucite container, until the air is driven from the filter holder.
6. Tighten the filter holder until snug. Open the toggle valve again and fill the 1/4" Tygon tubing with liquid.
7. Insert one CO<sub>2</sub> cartridge into each of the containers on the regulator assembly, making certain not to tighten the CO<sub>2</sub> cartridge holder.
8. Place the speed coupler on the speed connector, which is on the top of the Lucite container, and press downward until fastened.



Tip

**A nitrogen bottle with a low pressure regulator can be used as a replacement for the CO<sub>2</sub> regulator apparatus. To do this, place a speed coupler on the hose from the nitrogen regulator so that the hose can be fastened to the Lucite container.**

9. Make sure the regulator adjustment screw is backed off before puncturing the CO<sub>2</sub> cartridge. Check to be sure both needle valves are closed on the regulator assembly. Puncture the CO<sub>2</sub> cartridges by tightening the CO<sub>2</sub> containers.
10. Open the needle valves slowly. Adjust the pressure on the Lucite container to 20 PSI which is maintained during filtration. If the pressure exceeds 20 PSI, open the bleeder valve until the pressure drops to 20 PSI.



Note

**The 20 psig pressure is also maintained during filtration when nitrogen is being used.**

11. Place the 1/4" Tygon tubing in the 1,000-mL graduated cylinder and open the toggle valve above the filter holder until the 1/4" tubing is liquid filled.

12. Open the toggle valve connected to the Millipore filter holder and at the same time start the stop watch. Record the time interval for a given volume of through-put four or five times during filtration or every 100 mL of through-put.
13. Upon completion of filtration, close the toggle valve above the filter holder. Then, back off the adjustment screw on the CO<sub>2</sub> regulator.
14. Open the bleeder valve and reduce the pressure in the cylinder to atmospheric pressure. Remove the filter from the filter holder very carefully.
15. Remove the regulator assembly from the Lucite container. Remove the wing nuts from the top of the Lucite container. Remove the lid of the container.
16. Carefully clean the Lucite container with soap and water. Rinse with distilled water and dry before reassembling the container.



Important

**Do not use acetone, alcohol, chlorinated, or aromatic solvents for cleaning the Lucite container.**

**The pressure relief valve on top of the Lucite container must relieve full volume at 25 psig.**

## ***Results***

The data accumulated from the membrane filtration test can be plotted to compare the plugging tendency of one source water with another or when comparing commingled source water and formation water. This is done by plotting the flow rate (mL/sec) on the Y-axis vs. the cumulative volume (mL) on the X-axis.