

Bacteria Control in Desalination Systems

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Desalination systems are installed to provide clean water for many different applications. Process water for industrial processes, boiler feed water and even water for irrigation is possible using desalination

technology. Of course creating potable water for human consumption is also a major application.

In many desalination systems, the water produced is pumped to storage and then to its intended use. The intended use may require that the water have low bacteria levels. In those cases, a filter (Housing E in Figure 1) can be used to prevent any bacteria that may be in the system from reaching downstream users.

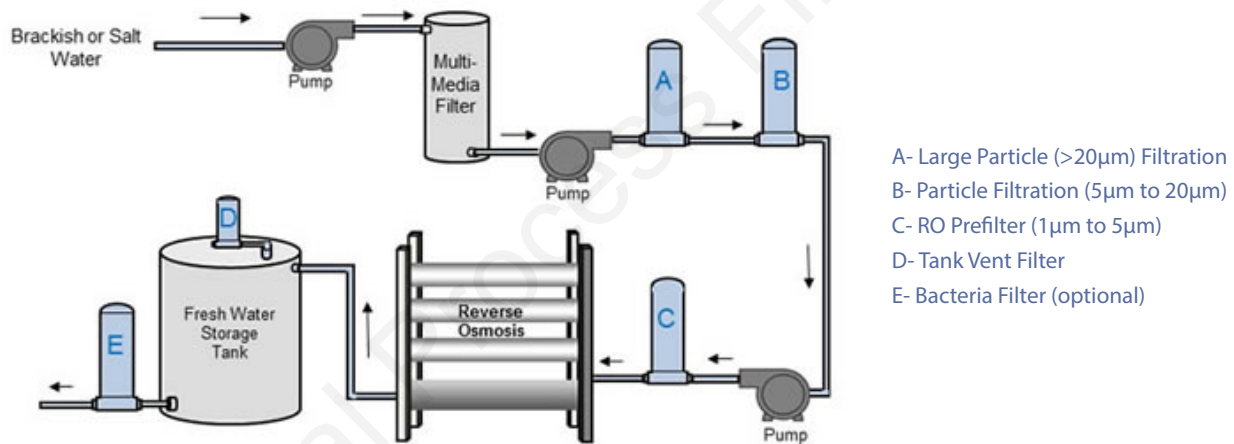


Figure 1: Filters in a Desalination System

Understanding Bacteria Filters

In medical and pharmaceutical industry applications, filter systems are expected to remove all bacteria so that the resulting water is 'bacteria-free' for use in the making of drugs or treating patients. The best filters for bacteria removal are 'sterilizing filters' made to pharmaceutical industry standards. They must be proven to remove 'all' bacteria and must be shipped with a certificate of compliance in each package. That certificate should state that the filter has passed quality tests proving that it will remove bacteria.

Critical Process Filtration supplies pharmaceutical-grade filters with the appropriate documentation.

Insurance Against Water System Contamination

If the desalination system is equipped with a chemical treatment system for the water produced, then bacteria filtration may not be needed as part of the system. If the system has no chlorination, ozonation or similar process the water is stored and distributed with no chemical protection against bacteria. Any

organisms that enter the system will be viable and may be distributed downstream to all users.

Many waterborne organisms form biofilms which, once established, are extremely difficult to remove. Some systems may be designed and operated with periodic chemical or heat sanitization processes, which can inhibit the formation of biofilms. However, bacteria can still enter through open tank vents, open distribution lines or 'dead legs' and move downstream, possibly interfering with the intended use of the water.

Housing E in Figure 1 is where the 'bacteria removal' filter can be located. Removing bacteria before the water is moved very far downstream reduces the opportunity for biofilm formation.

Tank vent filters (Housing D in Figure 1) may also be used as a barrier to bacterial contamination. These

hydrophobic membrane-based filters keep airborne bacteria in the environment from entering tanks as they are emptied.

Filter Options

All of the filters chosen need to tolerate any chemical disinfectants used in the system (bleach, peracetic acid, etc). Filters also should be constructed to withstand any heat sterilization or sanitization cycles (hot water or steam) used during normal system operation.

The table below shows the filter media options from Critical Process Filtration. All are available in cartridges and capsules for large and small systems.

Contact Critical Process Filtration for assistance in determining the best filter options for your system.

Filter Options for Bacteria Control in Desalination Systems

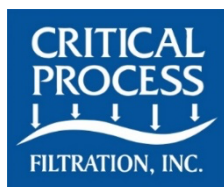
| Process Area | Filter Application | Filtration Function | Media ** |
|-----------------------------------|--------------------------------|--|------------------------|
| Bioburden Control and Sterilizing | Bioburden Reduction | Remove most bacteria from the water stream to help meet water quality requirements | CWPS, PVWL, NC, NM, PS |
| | Bacteria Removal (Sterilizing) | Remove all bacteria from the water stream | PS, NC, NM |
| | Tank Vent Filtration | Prevent bacteria from entering tanks when liquid is drawn from them | PM, PVWB, TM |

****Media Codes**

CWPS = High Capacity PES Membrane
PS = Polyethersulfone Membrane
PM = Polypropylene Membrane

NC = Charged Nylon 6,6 Membrane
PVWL = High Capacity Hydrophilic PVDF Membrane
TM = PTFE Membrane

NM = Nylon 6,6 Membrane
PVWB = High Capacity Hydrophobic PVDF



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