



Acceptable membrane filters

331-617 • March 2021

We will accept the membrane filters below for piloting or other state-approved field evaluations (WAC 246-290-676). Lab or field studies showed that these filters remove acceptable levels of *Cryptosporidium* (or acceptable surrogate) and meet the required material performance standard (WAC 246-290-220(1)).

Applicable Requirements: By accepting these membrane filters, we do not diminish the need to conduct a pilot test or other state-approved field evaluation. You must still do a predesign study to establish the best way to produce satisfactory finished water quality and to justify your choice of filtration technology (WAC 246-290-250).

Requirements that apply to each membrane filter listed below:

- ◆ **Disinfection** (WAC 246-290-662).
- ◆ **Turbidity performance** (WAC 246-290-660): ≤ 0.10 NTU in 95 percent of all four-hour measurements taken each month, never to exceed 1.0 NTU.
- ◆ **Turbidity monitoring** (WAC 246-290-664): Continuous on the combined filter effluent.
- ◆ **Indirect integrity monitoring** (particle counts or high-resolution turbidity) on each membrane unit according to product-specific approval.

Refer to the manufacturer's product-specific information prior to design.

| Manufacturer | Model | Pathogen Removal Credit (Log) ¹ | | | Flux Rate, Max @ 20C (gal/sf/day) | Trans-membrane Pressure ² Max | Initial Test Pressure Min | Quality Control Release Value ³ | Direct Integrity Test Default Upper Control Limit (UCL) ^{4,5} |
|-------------------|--------------------------------------|--|---------|---------|-----------------------------------|--|---------------------------|--|--|
| | | Crypto | Giardia | Viruses | | | | | |
| GE (Zenon) | ZeeWeed 500 | 3.0 | 3.0 | 0 | APPROVED FOR EXISTING USES ONLY | | | | |
| GE (Zenon) | ZeeWeed 1000 V4 | 3.0 | 3.0 | 0 | 60 | -13 psi | 12.5 psi | 0.20 psi/min | 0.60 psi/min |
| GE (Zenon) | ZeeWeed 1500 | 3.0 | 3.0 | 0 | 100 | 45 psi | 13.6 psi | 0.070 psi/min | 0.10 psi/min |
| GE(Zenon) | ZeeWeed 1500-600 | 3.0 | 3.0 | 1.0 | 90 | 45 psi | 13.7 psi | 0.179 psi/min | 0.25 psi/min |
| GE (Zenon) | Homespring | 3.0 | 3.0 | 0 | 4.5 gpm cont. or 11 gpm peak | 40 psi | 15.0 psi | Under Review | 0.36 psi/min |
| Pall | Microza USV-6203 Microza UNA-620A | 3.0 | 3.0 | 0 | 120 | 43.5 psi | 25.0 psi | <1 bubble at 29 psi, 1 minute hold time | 0.33 psi/min |

¹We may grant greater *Cryptosporidium* and *Giardia lamblia* removal on a case-by-case basis with more stringent control limits.

²Negative pressure indicates that the membrane system operates under a vacuum.

³The manufacturer's quality control test criteria to ensure that each module shipped from the factory achieves the same *Cryptosporidium* removal as those that were independently challenge tested.

⁴Direct integrity test performed at least daily. You must perform a direct integrity test immediately if the system exceeds an indirect integrity-monitoring threshold for 15 or more minutes. You also must perform a direct integrity test once every 4 hours as long as the system continues to exceed the threshold. The indirect integrity monitoring threshold for all listed membranes is either:

- Particle Counts (size >2 um): 30 counts /mL
- Turbidity: 50 mNTU

⁵Membrane unit shuts down automatically if the direct integrity test exceeds the UCL or the Log Removal Value (LRV) is less than 3.0. If the membrane unit shuts down based upon the LRV value, you must use a DOH-approved algorithm. Consult with the regional engineer on the LRV approval process.

| Manufacturer | Model | Pathogen Removal Credit (Log) ¹ | | | Flux Rate, Max @ 20C (gal/sf/day) | Trans-membrane Pressure ² Max | Initial Test Pressure Min | Quality Control Release Value ³ | Direct Integrity Test Default Upper Control Limit (UCL) ^{4,5} |
|-------------------------|-----------------------------------|--|---------|---------|-----------------------------------|--|---------------------------|--|--|
| | | Crypto | Giardia | Viruses | | | | | |
| Siemens (Evoqua) | M10C Part 111008 | 3.0 | 3.0 | 0 | APPROVED FOR EXISTING USES ONLY | | | | |
| Siemens (Evoqua) | S10N – Part 119211 | 3.0 | 3.0 | 0 | 80 | 22 psi | 14.0 psi | 9.0 sec/mL | 0.39 psi/min |
| Siemens (Evoqua) | L10N – Part 111315 | 3.0 | 3.0 | 0 | 155 | 22 psi | 14.0 psi | 9.0 sec/mL | 0.20 psi/min |
| Siemens (Evoqua) | L20N – Part 11062 | 3.0 | 3.0 | 0 | 155 | 22 psi | 14.0 psi | 6.0 sec/mL | 0.57 psi/min |
| Seccuca | Phoenix: Module DizzerXL0.9MB60 | 3.0 | 3.0 | 0 | 59 | 36 psi | 21.75 psi | 0.145 psi/min | 0.25 psi/min |
| Seccuca | Virex: Module – SeccuMem Pro 1000 | 3.0 | 3.0 | 0 | 53 | 36 psi | 22.4 psi | 0.007 psi/min | 0.35 psi/min |
| Westech/Polymem | UF 120 S2 | 3.0 | 3.0 | 0 | 60 | 29 psi | 16.3 psi | 0.49 psi/min | 0.90 psi/min |
| Westech/Toray | HFU 2020N | 3.0 | 3.0 | 0 | 100 | 29 psi | 18.2 psi | 0.029 psi/min | 0.39 psi/min |
| Westech/Toray | HFUG 2020AN | 4.0 | 4.0 | 0 | 120 | 29 psi | 17.44 psi | 0.029 psi/min | site-specific ⁶ |

⁶The UCL must be submitted for DOH approval based on site-specific conditions. UCL must be set for at least a design log removal credit of 3.0 log and for no more than the maximum log removal credit of 4.0.

For more information

Call your ODW regional office.

Eastern Region: Spokane Valley (509) 329-2100

Northwest Region: Kent (253) 395-6750

Southwest Region: Tumwater (360) 236-3030

Our publications are available at doh.wa.gov/odwpubs.



To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email civil.rights@doh.wa.gov.