

**California Surface Water Treatment Rule  
Alternative Filtration Technology Summary  
CDPH DDWEM Technical Programs Branch – August 2011**

Manufacturer or Vendor	Model or Product Designation	Membrane Type	Pathogen log <sub>10</sub> Removal Credit			Maximum Flux Lph/m <sup>2</sup> (gfd)	Maximum TMP (psi)	
			Virus	<i>Giardia</i>	<i>Cryptosporidium</i>			
<b>Membranes</b>								
Aquasource	Advent	UF	*	4	4	136 (80)	29	
Dow	Dow UF (SFD2860)	UF	*	4	4	102 (60)	30	
GE Osmonics Desal	Desal DK5	NF	*	3	2 <sup>A</sup>	N/A	70-400 <sup>B</sup>	
GE Zenon	ZeeWeed 500 series	UF	*	4	4	85 (49.8)	24 (in Hg)	
	ZeeWeed <sup>C</sup> 1000 V2 & V3	UF	*	4	4	93.4 (55)	12 (vac)	
	ZeeWeed 1000 V4 (550 sq-ft)	UF	*	4	4	102 (60)	13	
	ZeeWeed 1500 (550 sq-ft)	UF	*	4	4	170 (100)	45	
	Homespring <sup>D</sup> (UF207,UF209,UF211)	UF	*	4	4	(90)	40	
Hydranautics	HYDRAcap	UF	*	4	4	119 (69.3)	18	
Inge	Dizzer	UF	*	4	4	156 (92)	29	
Koch	PMPW	UF	*	4	4	173 (102)	35	
METAWATER (NGK)	431011	MF	*	4	4	(175)	55	
Norit X-Flow	S225 UF	UF	*	4	4	127.3 (75)	31	
	SXL225	UF	*	4	4	127.3 (75)	31	
Pall	Microza	USV 6203	MF	0.5 <sup>E</sup>	4	4	203.7 (120)	43.5
		USV 5203	MF	0.5 <sup>E</sup>	4	4	203.7 (120)	43.5
		UNA 620A	MF	0.5 <sup>E</sup>	4	4	203.7 (120)	43.5
	UNA 620A1	UF	*	4	4	102 (60)	51	
Siemens Memcor	Polypropylene (M10B, M10C, S10T)	MF	0.5 <sup>E</sup>	4	4	110 (66.9)	15	
			0 <sup>E</sup>	4	4	160 (93.6)	17	
	PVdF (M10V)	MF	0.5 <sup>E</sup>	4	4	85 (50)	29	
	PVdF (S10V, L10V, L20V)	UF	*	4	4	88 (52)	22	
Toray	Torayfil (HFS-2020)	UF	*	4	4	202 (120)	29	
	Torayfil (LSU-1515)	UF	*	4	4	83 (49)	10	
Toyobo	Durasep (UPF0860, UPF0870)	UF	*	4	4	119 (70)	35	
WestTech Polymem	UF 120S2	UF	*	4	4	45 (27)	21	

<sup>A</sup> - The Water Treatment Committee (WTC) has accepted this membrane as demonstrating at least 1-log virus removal. Virus removal credit for each plant will be assigned based on plant performance results and commitments as described in the operations plan. Regardless of removal credit, each plant is required to provide a minimum of 0.5-log *Giardia* and 4-log virus inactivation. Full-scale performance will depend on operational parameters such as actual *Cryptosporidium* operational Upper Control Limit and the amount of fouling.

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Manufacturer	Model or Product Designation	Clarifier Type	Pathogen log <sub>10</sub> Removal Credit			Clarifier / Filter Loading Rate (gpm/ft <sup>2</sup> )
			Virus	<i>Giardia</i>	<i>Cryptosporidium</i>	
<b>Contact Clarification-Filtration Systems</b>						
American Water Technology, Inc.	MB/WF series <sup>Ⓔ</sup>	Downflow	1 <sup>H</sup>	2 <sup>H</sup>	2	5 / 3 <sup>L</sup>
Culligan and Siemens	MultiTech	Downflow	1 <sup>H</sup>	2 <sup>H</sup>	2	3 / 3 <sup>L</sup>
Infilco Degremont	Advent Package Water Treatment Plant		2/1 <sup>L</sup>	2.5/2 <sup>L</sup>	2	
Siemens Microfloc	Trident; Trimite	Upflow-buoyant media	2/1 <sup>L</sup>	2.5/2 <sup>L</sup>	2	10 / 5 <sup>K</sup>
Pacific Keystone	KEY-PAC AC	Upflow-nonbuoyant media	1 <sup>H</sup>	2 <sup>H</sup>	2	10 / 5 <sup>K</sup>
Pata Engineering	PV-5 PV-10	Downflow	1 <sup>H</sup>	2 <sup>H</sup>	2	3-6 / 3 <sup>L</sup>
	PV-20 or larger	Upflow-non buoyant media	1 <sup>H</sup>	2 <sup>H</sup>	2	5-10 / 6 <sup>K</sup>
Roberts Filter Co.	Pacer II	Upflow-nonbuoyant media	2/1 <sup>L</sup>	2.5/2 <sup>L</sup>	2	10 / 5 <sup>K</sup>
<b>Pressure Filters</b>						<b>Filter Loading Rate</b>
EPD Wearnes (USA) Inc.	EPD Alternative Filtration	Inline, High rate, dual stage	1	2	2	Up to 6 NTU <sup>L</sup> ; 12 gpm/ft <sup>2</sup>
Serck Baker	Hi Rate Pressure Filtration	Inline, High rate	1	2	2	Up to 20 NTU <sup>L</sup> ; 5 gpm/ft <sup>2</sup>
						Up to 9 NTU <sup>L</sup> ; 12 gpm/ft <sup>2</sup>

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Manufacturer	Model or Product Designation	Pathogen log <sub>10</sub> Removal Credit			Filter Loading Rate (gpm/bag)	Maximum Pressure Differential (psi)
		Virus	<i>Giardia</i>	<i>Crypto-sporidium</i>		
<b>Bag and Cartridge Filters</b>						
USFilter	ELB 921	0	2		10	10
LaPointe Industries/ Strainrite	Aqua-Rite Potable Water Filtration System Bag Filter Model HPM97-CC-2SS	0	2	1.5	20	16
	<i>Prefilter:</i> HPM99-CC-2-SR  <i>Final Filter:</i> HPM99-CCX-2-SR; both in an AQ2-2 housing  Or  In a AQ2-2B-SHD (350740) housing equipped with the AQ-1 compression device	0	3	3	20	25
Rosedale	<i>Prefilter:</i> GD-PO-523-2  <i>Final Filter:</i> GLR-PO-825-2	0	2	1	10 (w/ prefilter) 3 (w/out prefilter)	10
	<i>Prefilter:</i> PS-520 PP-241  <i>Final Filter:</i> GLR-PO-825-2 <u>M</u>	0	2	2	13 (must be operated with both filters in series as noted)	PS-520 PP-241: ΔP=20 GLR-PO-825-2: ΔP=2.5

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<sup>A</sup> Desal DK5 - *Cryptosporidium* credit is based on the 2-log virus removal previously demonstrated. To be used on Bin 1 waters only. Integrity testing needs to be developed. (WTC 11/15/06)

<sup>B</sup> Desal DK5 - typical operating pressure range.

<sup>C</sup> The October 4, 2004 acceptance of the ZeeWeed 1000 membrane (including the V2 and V3 membranes) at 55 gfd and 12 psi superseded and replaced the prior acceptance at 30 gfd and 10 psi. The V3 membrane is accepted for 450 to 675 sf modules.

<sup>D</sup> Homespring UF211: manufacturer specifies maximum continuous flow at 4.5 gpm and TMP no higher than 20 psi to maintain warranty.

<sup>E</sup> The WTC has accepted this membrane as demonstrating at least 1-log virus removal as set forth in Section 64653(f) based on demonstration of at least 1-log removal 50 percent of the time, while 0.5-log removal was demonstrated 95 percent of the time.

<sup>F</sup> Memcor Polypropylene (for 0-log virus removal credit): In order for this technology to be used in systems serving more than 500 persons, the utility must request and receive from CDPH a waiver for the 1-log (90 percent) virus removal requirement. The request must include sufficient information to demonstrate the lack of a virus hazard in the watershed, including but not limited to, an updated watershed sanitary survey.

<sup>G</sup> American Water Technology offers multiple system sizes under the MB/WF treatment series. All systems held to the same maximum clarifier and filter loading rates are expected to have equivalent performance.

<sup>H</sup> Accepted as equivalent to direct filtration only; turbidity performance standard is 0.3 NTU in 95% of samples, not to exceed 1.0 NTU.

<sup>I</sup> Accepted as equivalent to conventional and direct filtration, with different removal credit and turbidity performance standard for each operating mode:

Conventional filtration mode: turbidity performance standard = 0.2 NTU, not to exceed 1.0 NTU

Direct filtration mode: turbidity performance standard = 0.3 NTU, not to exceed 1.0 NTU

<sup>J</sup> Multi-media pressure filter – maximum filter loading rate of 3.0 gpm/ft<sup>2</sup> allowed under the SWTR

<sup>K</sup> Multi-media gravity filter – maximum filter loading rate of 6.0 gpm/ft<sup>2</sup> allowed under the SWTR

<sup>L</sup> Source water maximum turbidity

<sup>M</sup> See 2/14/2007 memo “Rosedale Model Number Guidance” and associated “Interpreting Model Numbers.” This memo is intended to aid those inspecting and permitting water systems using Rosedale filtration systems as an alternative filtration technology to meet the requirements of the Surface Water Treatment Rule.

**Disclaimer:** This summary of accepted alternative filtration technologies has been extracted from the Department’s Alternative Filtration Technology Report (June 2001 Draft) and individual acceptance letters. It is not intended to be used as a standalone document for persons planning, designing, or operating a water treatment plant. The summary does not contain all exceptions or qualifications for the individual filtration technologies. Please consult the Department’s Alternative Filtration Technology report and the individual acceptance letters for additional details and recommendations.

Copies of the acceptance letters issued by the Department for the alternative filtration technology may be obtained from the Drinking Water Program district offices. The Alternative Filtration Technology Report may be downloaded from the Department’s website at: <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Publications.aspx>

Review and approval of an alternative filtration technology listed in this summary for use on a particular public water system source will be handled on a case-by-case basis via the permit process by the CDPH District offices.