

EnviQ[®]

Submerged Ultrafiltration Membranes



HOW EnviQ WORKS

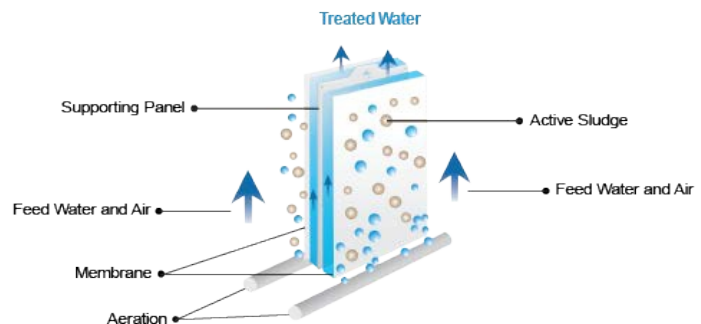
QUA's EnviQ Membranes have been specially designed to improve the ease of operation and maintenance of MBR facilities. The EnviQ membrane has billions of microscopic pores on the surface that form a barrier to impurities, allowing clean water to pass through the pores by using gentle suction. EnviQ provides consistent and ultrafiltration quality effluent using a strong and rugged PVDF flat sheet membrane and proprietary diffuser system.

ADVANTAGES

- **Reverse Diffusion**
Clean water ensures consistently low transmembrane pressure (TMP)
- **Simple Rack Type Modular Design**
Allows easy removal and maintenance of membrane cartridge
- **No External Frame**
Provides a "membrane only" surface to minimize biofouling
- **Proprietary Air Diffuser System**
Optimizes power consumption and reduces cleaning requirement

THE TECHNOLOGY OF CHOICE

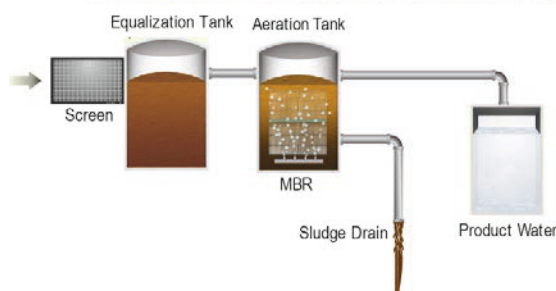
In addition to simpler operations, EnviQ lowers the total installed cost of biological wastewater treatment and recycle systems as compared to conventional activated sludge processes with tertiary filtration. EnviQ facilitates increased MBR adoption, resulting in more efficient biological treatment, smaller footprint and high quality effluent.



MBR combines conventional activated sludge technology with membrane filtration. MBR can be designed at a much higher mixed liquor suspended solids (MLSS) concentration compared to conventional processes, giving advantages of lower hydraulic retention time (HRT) and higher sludge retention time (SRT). This reduces the footprint of the overall wastewater treatment.

In addition, MBR replaces clarifier/sedimentation tanks as well as media filtration. The treated water is highly superior and can be used directly, or as feed to a reverse osmosis unit. EnviQ is available in modular construction. This ensures the ease of design as well as maintenance.

Submerged Membrane Bioreactor (SMBR)



EnviQ®

Submerged Ultrafiltration Membranes



Product Specifications

		EnviQ Cartridge	EnviQ Model						
			4C	8C (V)	8C (H)	12C	16C (V)	16C (H)	32C
Pore Size		0.04 microns							
Membrane Type		PVDF Outside-In, Hydrophilic							
Membrane pH Tolerance		2 - 10							
Membrane Temperature Tolerance ¹		5 - 40°C / 41 - 104°F							
Effective membrane Area (ME) m ² (ft ²)		0.182 (1.96)							
Number of Cartridges		1	4	8	8	12	16	16	32
Total Nominal Membrane Area m ² (ft ²)		10 (108)	40 (431)	80 (861)	80 (861)	120 (1,292)	160 (1,722)	160 (1,722)	320 (3,444)
Flow m ³ /day (gpd) ²	Minimum	2.4 (634)	9.6 (2,536)	19.2 (5,073)	19.2 (5,073)	28.8 (7,609)	38.4 (10,145)	38.4 (10,145)	76.8 (20,291)
	Maximum	6.0 (1,585)	24.0 (6,341)	48.0 (12,682)	48.0 (12,682)	72.0 (19,022)	96.0 (25,363)	96.0 (25,363)	192.0 (50,726)
Air Flow (m ³ /hr) ³		N/A	20.0	20.0	40.0	60.0	40.0	80.0	80.0
Dimensions		Carbon Steel							
Dimensions (CS)	Length mm (in)	478 (18.8)	857 (33.7)	856 (33.7)	858 (33.8)	1,165 (45.9)	856 (33.7)	1,620 (63.8)	1,625 (54.0)
	Width mm (in)	291 (11.5)	705 (27.8)	745 (29.3)	1,231 (48.5)	1,198 (47.2)	1,230 (48.4)	1,200 (47.2)	1,267 (49.9)
	Height mm (in)	461 (18.1)	1,607 (63.3)	2,751 (108.3)	1,627 (64.1)	1,612 (63.5)	2,751 (108.3)	1,635 (64.4)	2,771 (109.1)
Module Weight (Dry) kgs (lbs)		25 (55)	238 (525)	445 (981)	417 (919)	562 (1,239)	771 (1,700)	748 (1,649)	1,363 (3,005)
Dimensions		Stainless Steel							
Dimensions (SS)	Length mm (in)	478 (18.8)	858 (33.8)	858 (33.8)	858 (33.8)	1,180 (46.5)	892 (35.1)	1,574 (62.0)	1,574 (62.0)
	Width mm (in)	291 (11.5)	723 (28.5)	723 (28.5)	1,260 (49.6)	1,270 (50.0)	1,273 (50.1)	1,276 (50.2)	1,276 (50.2)
	Height mm (in)	461 (18.1)	1,566 (61.7)	2,646 (104.2)	1,566 (61.7)	1,645 (64.8)	2,673 (105.2)	1,693 (66.7)	2,773 (109.2)
Module Weight (Dry) kgs (lbs)		25 (55)	197 (434)	354 (780)	357 (787)	509 (1,122)	647 (1,426)	663 (1,462)	1,186 (2,615)
Connection Flange									
Permeate		NA	ANSI 1"	ANSI 1.5"	ANSI 1"	ANSI 1.5"	ANSI 1.5"	ANSI 2.0"	ANSI 2.0"
Air Diffuser		NA	ANSI 1"	ANSI 1"	ANSI 1"	ANSI 1"	ANSI 1"	ANSI 1"	ANSI 1"
No. of Air Diffusers		NA	5	5	5	6	5	10	10
Permeate Header Material		NA	PVC						
Cartridge Connector Material		SS 316	SS 316						
Air Diffuser Material		NA	EPDM						

¹The optimal temperature range for the biological active sludge is 20 – 37 °C (68 – 98.6 °F).

²Flow is calculated considering 24 hours of operation.

³Air requirement given is for membrane scrubbing only and does not include air for the biological process.

*Average flow is considering 24 hours of operation.

Technical Information

Operational Parameters	Unit	Range
MLSS	mg/L	3,000 – 15,000
Filtrate Flux Range	lmh / gfd	10 – 25 lmh / 6 – 15 gfd (Dependent on feed conditions)
Operating Transmembrane Pressure	mmHg psi	100 mm Hg (Typical) - 200 mm Hg (Maximum) 2.0 psi (Typical) - 4 psi (Maximum)
Backpulse Transmembrane Pressure	mmHg / psi	100 mmHg / 2.0 psi (Maximum)
Backpulse Requirement	N/A	15 minutes every 2-4 hours
Operating pH Range	-	5 - 9
Typical Product TSS	mg/L	< 3.0
Typical Product Turbidity	NTU	< 1.0
Cleaning Chemicals		
Maintenance Cleaning ⁴	NA	NaOCl (200 ppm as Cl ₂) and Citric Acid (1,000 ppm)
Recovery Cleaning ⁵	NA	NaOCl (1,000 ppm as Cl ₂) and Citric Acid (1,000 ppm)

⁴Typically required once a week depending on feed conditions.

⁵Typically required once every 3-4 months depending on feed conditions.

Oil and grease must be removed prior to using EnviQ membranes