



**MEMCOR® membranes for  
drinking water applications**

Water Technologies

**SIEMENS**



Memcor® membranes

## Why choose membrane filtration?

As ever-tightening water regulations continue to challenge the limits of conventional filtration methods, municipalities look to innovative technologies to ensure the highest quality drinking water for their communities. Compared to most conventional technologies, Memcor membranes offer significant performance and cost advantages to ensure safe, reliable water, day after day.

### Advantages of membranes:

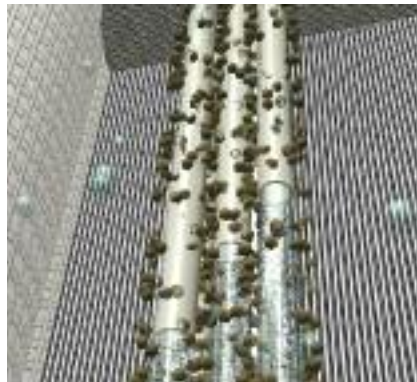
- Physical barrier to prevent *Cryptosporidium*, *Giardia*, bacteria, turbidity, and suspended solids without the need for chemical pretreatment.
- Flexibility to handle changing feed water conditions and capacity demand increases.
- Simple, Automated operation ensuring system integrity is met and allowing operators advanced notice of potential maintenance.
- Lowest LIFE-CYCLE COSTS as compared to most conventional technologies.

# MEMCOR® Membrane Process Overview



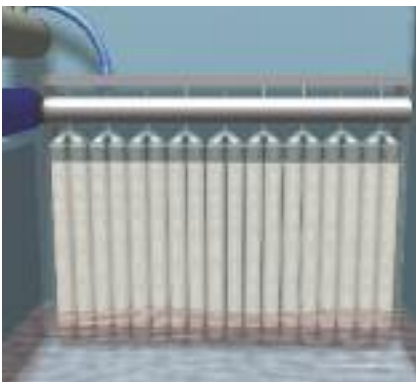
## Step 1 – Normal Filtration

Filtration takes place from the outer surface of the fiber to the hollow inner core, or lumen. Filtered water passes through the wall of the fibers while particulates in the feed stream are retained on the outside of the fiber wall. Particles larger than 0.1 microns are retained on the outside surface of the fibers.



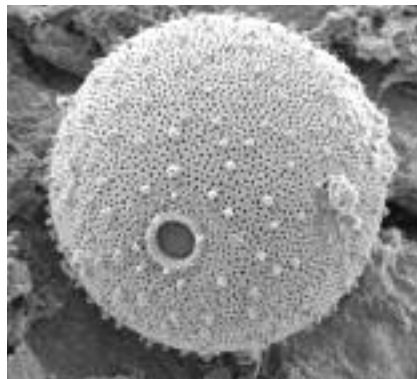
## Step 2 – Automated Backwash

Backwashing commences automatically after a set interval (usually 15-60 minutes) for a set duration of 90 seconds. The backwash cycle interval and duration are dependent upon feedwater conditions and are operator adjustable. During a backwash, both filtrate water and air are used to scour the membrane surface. Units are then drained to ensure harmful protozoa and bacteria are removed before returning to normal filtration.



## Step 3 – Chemical Cleaning

Periodically, chemical cleaning is needed to dissolve or detach the accumulated particles on the membrane surface that cannot be dislodged by backwashing. Memcor membranes are made of oxidant-tolerant materials, therefore, chlorine is typically used in cleaning. A low-strength acid is also used to help remove inorganics. Once the cleaning process is complete, the Memcor system automatically initiates a backwash to ensure all chemicals are removed before returning to normal filtration.



## Step 4 – Membrane Integrity Testing

Memcor membranes provide a physical barrier able to achieve reliable removal of *Cryptosporidium*, *Giardia*, and other harmful microorganisms. The key to this physical barrier is the ability to test fiber integrity using a direct integrity test, called an Air Hold Test. This on-line, automated test uses compressed air to detect any flaw in a membrane fiber, seal or o-ring. Memcor membranes use an air pressure of 14 psi (96 kPa) to detect a 3-micron break, ensuring pathogen rejection.



MEMCOR® pressurized membrane system

MEMCOR® submerged membrane system

## MEMCOR® Membrane Technologies

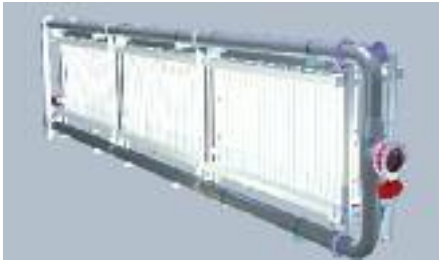
Memcor membranes have been proven in thousands of drinking water applications all over the world and come in both pressurized and submerged configurations to suit multiple needs. They are available as stand-alone, pre-packaged units or as components for large projects.

### Pressurized

Memcor pressurized membrane systems operate in a closed environment. Feedwater is pressurized through the units at 30 to 40 psi (200 to 275 kPa). Higher pressures can be used if additional residual pressure is needed for applications, such as pretreatment to reverse osmosis. The system has fully-automated processes including backwash, cleaning and membrane integrity testing. All membrane modules are individually isolatable, ensuring consistent operation.

### Submerged

Memcor submerged membrane systems operate in an open tank design. Feedwater typically flows by gravity into the membrane cell. A suction pump draws filtrate water through the membranes up to 12 psi (83 kPa). Submerged systems are ideal for retrofitting existing basins and increasing capacity in a small footprint. The system has fully-automated processes including backwash, cleaning and membrane integrity testing. Membrane modules are isolatable in groups of four or clovers.



Top: MEMCOR® CP System  
Bottom: MEMCOR® XS Package Plant

MEMCOR® CS System

MEMCOR® XP Package Plant

## MEMCOR® Membranes. Broad Product Range.

### MEMCOR® XP Pressurized Package Plant

Self-contained, factory-tested, pre-packaged unit that treats 25 to 200 gpm (6 to 48 m<sup>3</sup>/h) on one skid. The simple, compact design is easy to operate and install. Ideal for small communities, new developments, schools and remote systems that require minimal operator attention.

**MEMCOR® XS  
Submerged Package Plant**  
Fully skid-mounted and self-contained, the Memcor XS can treat 120 to 400 gpm (27 to 90 m<sup>3</sup>/h) on a single compact skid. The innovative side-door removal mechanism allows for easy service and reduces ceiling height requirements.

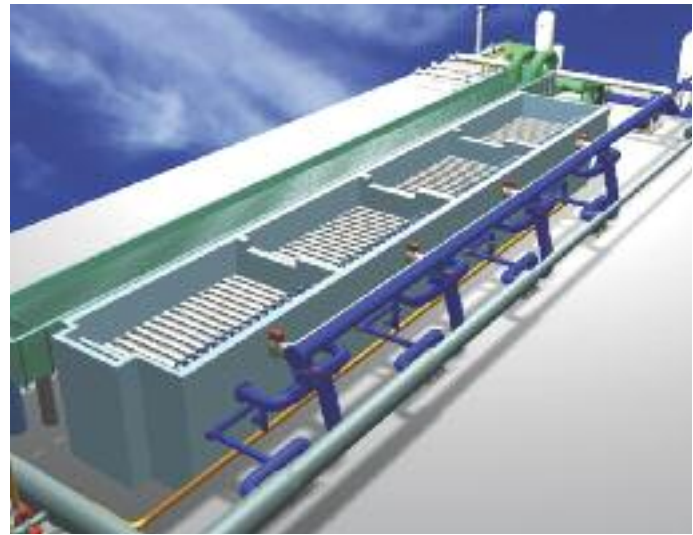
### MEMCOR® CP Pressurized Component System

The modular, "building block" configuration of the Memcor CP simplifies design, installation and expansion. Individual isolatable modules and reduced valves allow for easy operation. With a hydraulic capacity of 10 MGD (40 MLD) on one skid, the compact system is ideal for high-capacity projects.

### MEMCOR® CS Submerged Component System

Memcor CS is a robust, modular treatment system ideal for high solids applications, large capacity systems and conventional treatment plant retrofits. The open tank design allows for visual inspection for easy operation and maintenance. Each cell can be sized from less than 1 MGD (4 MLD) to over 10 MGD (40 MLD).

Quality. Reliability.  
Proven performance.

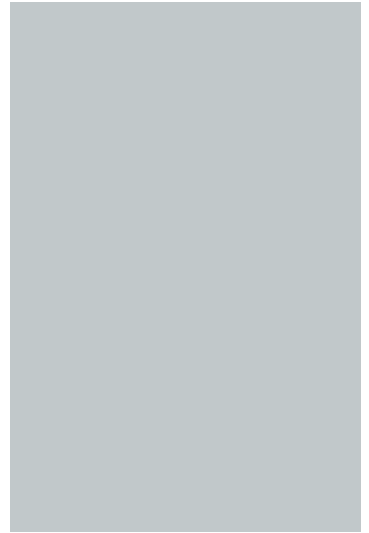


MEMCOR® membrane applications include:

- Removal of high solids
- Turbidity reduction to <0.02 NTU
- Retrofit of conventional filtration
- Large capacity system expansion or new construction
- Surface water treatment
- Groundwater treatment
- Pathogen and bacteria removal
- Small capacity systems requiring compact footprint or remote operation

### Typical MEMCOR Membrane Results

Parameter	MEMCOR Membrane Filtrate
Turbidity	<0.02 NTU
<i>Cryptosporidium</i>	>6-log reduction
<i>Giardia</i>	>6-log reduction
Coliform	>6-log reduction
Algae	>6-log reduction
SDI	<2.0



### Conventional Plant Retrofits

Kennewick, Washington needed to double their capacity in their existing footprint. By using Memcor submerged membranes, the city was able to retrofit their existing conventional plant to increase capacity from 7.5 MGD (29,000 m<sup>3</sup>/day) to 15 MGD (57,000 m<sup>3</sup>/day).



### Barrier Against Microorganisms

Portsmouth Water chose to install membrane filtration to proactively address potential contamination. The largest submerged plant in Europe has been operational since 2002 at a capacity of 22 MGD (84,000 m<sup>3</sup>/day).



### Treating Groundwater to Augment Drought Areas

The City of Salt, Jordan has minimal water reserves, despite increasing consumption demands. Well water, once thought to be unfit, is now treated with Memcor pressurized technology to remove harmful contaminants at a capacity of 6 MGD (24,000 m<sup>3</sup>/day).



### Emergency Response for People in Need

After the tsunami hit the coast of Sri Lanka, fresh drinking water became a precious commodity. Memcor Products responded with an easy-to-operate MEMCOR® XP system that provided potable water to more than 100,000 residents.

MEMCOR is a trademark of Siemens, its subsidiaries or affiliates.

The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

**North and South America**  
800.547.1202 Shrewsbury, MA, USA

**Europe, Middle East and North Africa**  
+44 (0) 1332 387300 Derby, England

**Asia Pacific, Southern Africa**  
+61 2 4577 6800 S. Windsor, NSW, Australia

information.water@siemens.com

MC-USADW-BR-1108

©2008 Siemens Water Technologies Corp.  
Subject to change without notice.