

The Future of water treatment has arrived!

In a world challenged for access to clean water, there exists a need for a water treatment solution that is compact, flexible, robust and sustainable. **That solution is here now.**



For more information, please visit:
www.pwntechnologies.com



For solutions enquiries, send an e-mail to info@pwntechnologies.com
or call PWN Technologies The Netherlands +31 (0)23 541 3740



The revolutionary C-series

Different sized CeraMac® packages for maximum design flexibility for any flow capacity

PWN Technologies has developed the revolutionary C-series based on its proven ceramic microfiltration block system CeraMac®. With different vessel sizes that closely match the flow requirement, the C-series delivers improved energy efficiency and operational performance.

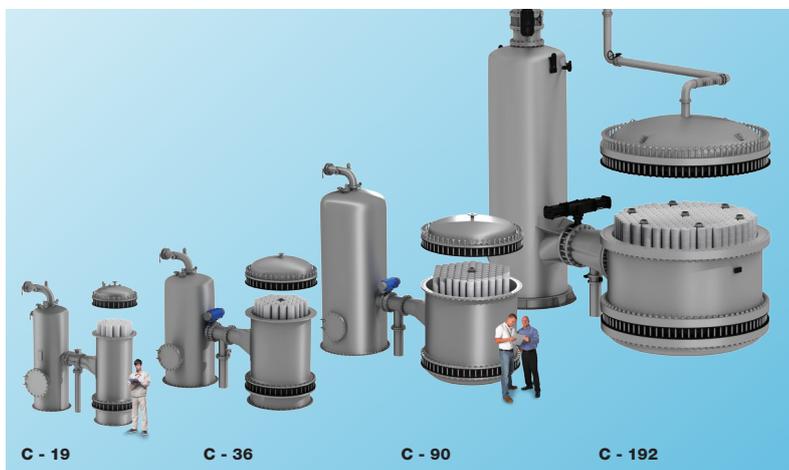
Models

Built on our proven ceramic microfiltration block design CeraMac® technology, the C-series is available in the following models for maximum design flexibility for any flow capacity: C-7, C-19, C-36, C-60, C-90, C-120, C-192.

Technical specifications

Type	Elements Number of membranes	Membrane vessel		Unit Skid mounted?
		Diameter (m)	Height (m) vessel bottom » top	
C - 7	7	0.6	2.2	yes
C - 19	19	1	2.35	yes
C - 36	36	1.4	2.5	yes
C - 60	60	2	2.75	yes
C - 90	90	2.4	2.9	no
C - 120	120	2.8	3.1	no
C - 192	192	3.5	3.5	no

Capacities will depend on local water conditions. Please contact us for a further discussion of your needs.



Product Benefits

- ▶ Easy to operate
- ▶ User-friendly
- ▶ Compact
- ▶ Small footprint
- ▶ Short production and delivery time
- ▶ Low operational cost
- ▶ Cost competitive
- ▶ Long warranty period

CeraMac[®] and SIX[®] success stories



Watch Andijk III webcam
<http://bit.ly/11Ao9fb>



South West Water video
<http://bit.ly/134cYif>

Andijk III PWN, The Netherlands

The Andijk III plant in the Netherlands is based on PWN Technologies' SIX[®] (Suspended Ion eXchange) and CeraMac[®] (ceramic membrane filtration process). It will produce water of a better quality with lower environmental impact and decreased energy consumption. Andijk III has a capacity of 5,000 m³ per hour or 120,000 m³ a day. SIX[®] removes water turbidity (dissolved organic substances, nitrate and sulphate). SIX[®] also ensures that the ceramic membranes are not contaminated too quickly. The passage through the ceramic membranes is the next phase of the treatment process. All particles larger than 1/10,000th of a millimeter are removed. Ceramic membranes last longer and are more reliable than polymeric membranes. CeraMac[®] is the first design that can compete with polymeric membranes in terms of price. The treated water may still contain a quantity of hazardous substances, such as pesticides, viruses or drug residues. That is why advanced oxidation is used after the CeraMac[®] process, which uses a combination of UV and hydrogen peroxide to render these substances harmless. Since the clarity of water has increased thanks to SIX[®] and CeraMac[®], considerably less energy is required for UV treatment. Finally, an active carbon filter removes the remaining substances from the water, making it fit for consumption. Andijk III is a showcase of innovation and will be fully operational in 2014.

agreement for the delivery of a SIX[®]/CeraMac[®] pilot facility. This facility was commissioned in February 2013 and will be tested over a period of 18 months. The pilot plant, which has been operating since April 2013, has treated surface waters from a reservoir and rivers to a high standard (i.e., UV transmissions > 98 percent). SIX followed by in-line coagulation will continue to be tested to determine the optimum flux for sustainable ceramic membrane operation. PWN Technologies has started preliminary design work of the full scale plant in Q1 2014 in close cooperation with SWW.

ther evaluate the reliability and sustainability of ceramic membranes technology for large scale operations. PWN Technologies collaborated with engineering company Black & Veatch and Meta-water who supplied the ceramic membrane elements for this project.

SIX[®]/CeraMac[®] Pilot South West Water, United Kingdom

In 2011 PWN Technologies and South West Water (UK) started a collaboration and feasibility project for the introduction of SIX[®]/CeraMac[®] in the southwest of England. In August 2012 PWN Technologies and South West Water signed an

CeraMac[®] Demo Plant PUB, Singapore

PWN Technologies designed and constructed Singapore's first ceramic membrane demo plant at Choa Chu Kang Waterworks to allow PUB and PWNT to test and optimize the system for local conditions. The \$5 million plant was tested for 18 months during which the daily capacity increased from 1.2 million liters/day at the onset to 3 million liters/day by the end of the testing period (mid-2011 till March 2013). The results exceeded expectations, with test results showing the CeraMac[®] system performed well as a ceramic membrane filtration system for clarified water with or without ozone although the use of pre-ozone improved operational efficiencies, with a stable transmembrane pressure (TMP) and minimal down-time for cleaning (920 days using ozone vs 92 days without). Fluxes were reached between 274 and 350 l/mh. The demo plant was made possible with a grant from the Technology Pioneer Scheme under the Environment & Water Industry Program Office (EWI). Through an initial pilot project in 2007 at the Bedok NEWater Factory with ceramic membranes which showed encouraging results, PUB had moved forward with this demo plant to fur-

CeraMac[®] Pilot Melbourne Water, Australia

PWN Technologies participated in a study funded by the Australian Water Recycling Center of Excellence (AWRCoE), and led by Victoria University. The study evaluated the efficacy of ozone in conjunction with ceramic membranes for water reuse over a 12-month period, with PWN Technologies supplying the membrane pilot plant and technical expertise. The trial was carried out at Melbourne Water's Eastern Treatment Plant (ETP) using secondary effluent from the plant as feed water. The test was conducted with ozone which in combination with CeraMac[®] led to enhanced plant performance. The ozone is disinfecting the water and at the same time is keeping the membranes clean for higher fluxes: 180 – 200 l/mh. The project partners/sponsors were the Australian Water Recycling Centre of Excellence, Victoria University, PWN Technologies, Black and Veatch, Melbourne Water, South East Water and Water Quality Research Australia.



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