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part of saur mission water

CeraMac®

Ceramic microfiltration system

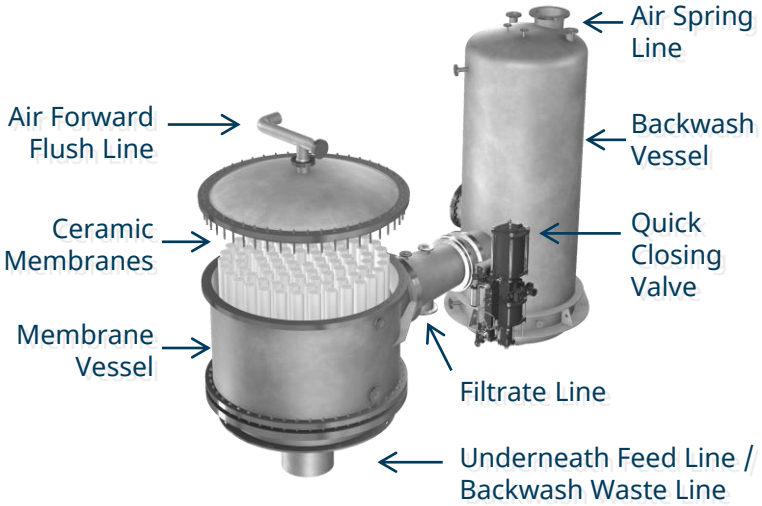
#missionwater

Robust and reliable microfiltration

CeraMac® is an innovative and cost-effective ceramic membrane designed by PWNT. This design allows the economically feasible use of ceramic membranes on surface water for large-scale applications, as well as in reuse and desalination pre-treatment applications.

- Removal of turbidity, 4.0 log *Giardia, and* 4.0 log *Cryptosporidium*
- Automated membrane integrity test (MIT)

PWNT CeraMac® system



The advantages of ceramic membranes

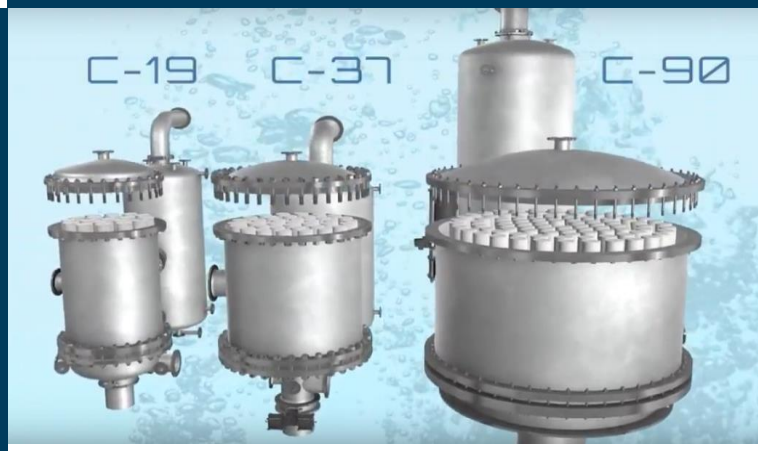
- No fiber breakage
- Indefinite life span (proven to be > 20 years in continuous usage)
- Compatibility with ozone in the feed water and as a cleaning option
- Possibility of using strong chemicals to clean the membrane and prevent fouling
- Use of high backwash rates to restore permeability

CeraMac® houses multiple ceramic units in a single vessel

CeraMac® offers a compact proprietary system with multiple membranes mounted in a single vessel. This reduces the cost of the ceramic membrane system to a level which makes the system cost competitive.

Ceramac® offers the following benefits:

- Very small footprint
- Low energy consumption
- High reliability
- Low maintenance
- Powerful backwash, at a pressure of 5 bar
- High productivity > 95%



Number of membranes	19	37	90
Filtration surface area per module unit	475 m^2	925 m^2	2,250 m^2

Pre-treatment

ILCA® | In-line Coagulation and Adsorption

ILCA® process was developed to minimize coagulation/flocculation footprint and to simplify pre-treatment upstream of **CeraMac®.** For most surface water, coagulated feed water lowers the membrane fouling rate, but strong, large, setting flocs are not required for ceramic microfiltration. **ILCA®** was developed to provide only the necessary mixing at a short contact time for the **CeraMac®** system.

Advantages ILCA® vs. conventional coagulation mixing tank:

- Compact
- No moving parts so no power consumption
- Controlled G/T values for micro-flocs
- Low carbon footprint

References

Andijk III
- The Netherlands
- Since 2014
- 120 MLD (32 MGD)
- CeraMac® C90 x 10

Luzern WTW
- Switzerland
- Since 2018
- 30 MLD (8 MGD)
- CeraMac® C37 x 3

CCKWW
- Singapore
- Since 2019
- 180 MLD (47 MGD)
- CeraMac® C90 x 12

Mayflower WTW
- United Kingdom
- Since 2019
- 90 MLD (24 MGD)
- ILCA®
- CeraMac® C90 x 10

Bonnycraig
- Scotland - UK
- Since 2022
- 4.5 MLD (1.2 MGD)
- ILCA®
- CeraMac® C19 x 4

Hampton Loade
- United Kingdom
- Ongoing project
- 210 MLD (55.5 MGD)
- CeraMac® C90 x 20

Witches Oak
- United Kingdom
- Ongoing project
- 90 MLD (24 MGD)
- ILCA®
- CeraMac® C90 x 14

Alderney
- United Kingdom
- Ongoing project
- 85 MLD (22.5 MGD)
- CeraMac® C37 x 10

Knapp Mill
- United Kingdom
- Ongoing project
- 63 MLD (16.6 MGD)
- CeraMac® C37 x 10

Eela
- Scotland, UK
- Ongoing project
- 6 MLD (1.6 MGD)
- ILCA®
- CeraMac® C19 x 6

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