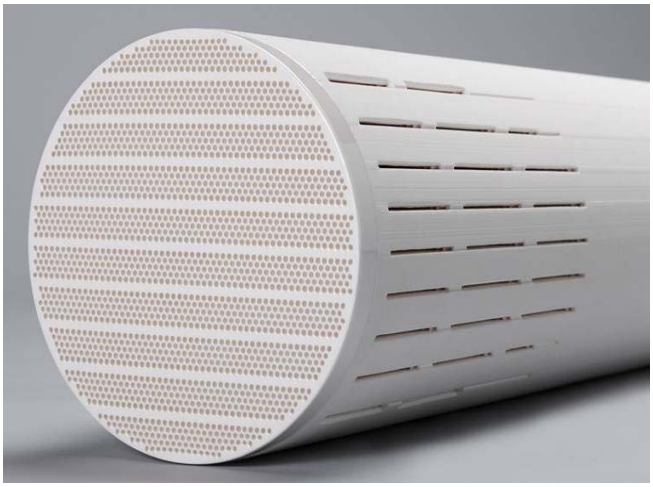
Aqua MultiBore® C-Series Ceramic Membrane - Key Features

The main feature of the Aqua MultiBore® C-Series Ceramic Membrane is the fact that it simply **doesn't break**. We are so confident of this claim that our standard warranty includes provisions to replace any membrane element that breaks within the 20-year life of the plant! The entire membrane element is made from a single material - aluminum oxide - which can handle the wide variations in temperature, pH, and pressure that cause polymeric membranes to fail.



The unbreakable nature of the membrane is supported by the fact that there have been no breaks in any of the 175+ systems that have been installed since the membrane was introduced 19 years ago.

Other major benefits of the membrane are:

1. **Low Risk of Permanent Fouling/Damage.** In addition to handling wide variations in temperature, pH, and pressure, the membrane is tolerant of most of the cleaning chemicals that will damage polymeric membranes. Because of this, the membrane can be cleaned at a high temperature and with a large variety of chemicals, greatly decreasing the likelihood that the membrane will become irreversibly fouled.
2. **High Flux.** The membrane operates stably at fluxes that are at least twice that of polymeric membranes. The California Department of Public Health (CDPH) has rated the membrane for drinking water applications at fluxes up to 175 gfd and trans-membrane pressures up to 55 psi.

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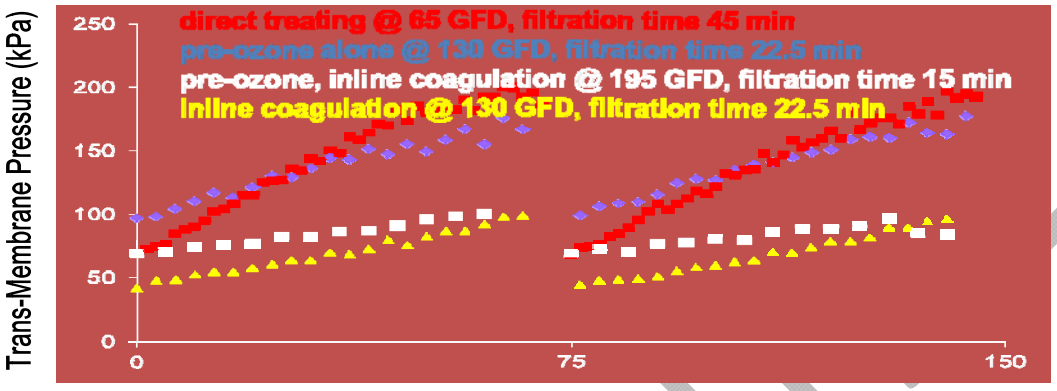
In municipal wastewater applications, the membrane has operated stably at fluxes as high as 195 gfd when the influent is pretreated with small doses of ozone and coagulant, as shown in white below. The ozone (O_3) – which rapidly degrades polymeric membranes – is used to break down the organic material responsible for the majority of membrane fouling.



3. **High Recovery.** The membrane's recovery is typically at or above 98%, much higher than polymeric membranes and more than most other ceramic membranes, as well. The reason for the higher recovery is the membrane's unique backwash, which is comprised of a very short blast of filtrate and air. This backwash uses less water and air than other membranes and allows the membrane to operate longer between backwashes and chemical cleanings.
4. **Many Installations.** Since 1998, the membrane has been operating at over 175 plants in 6 countries, including two in the U.S. Data from these installations is used to fine-tune each new design to provide the best solution for the client.
5. **Numerous Applications.** Applications include treatment of ground/surface/seawater for potable/industrial use, municipal/industrial wastewater for discharge/reuse, and industrial liquids for product use. The membrane is able to handle high solids and a wide variety of process streams, including hard-to-treat wastewaters. This is due to four unique characteristics of the membrane:
    - the membrane feed channels have a large diameter (2.5 mm), which minimize the chance of plugging;
    - the membrane uses an inside-to-outside filtration direction, which keeps all of the solids inside the feed channels so a low backwash flow produces a high velocity for solids removal;
    - the membrane is backwashed with a short, powerful blast of water and air, which is very effective in removing large amounts of solids; and
    - the membrane material is tolerant of most liquids and chemicals.

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