Aqua Membranes
PRINTED SPACER TECHNOLOGY®

Project overview

LOCATION:

University Of New Mexico, Ford Utility Center, Albuquerque NM

APLICATION TYPE:

Boiler Feed/Power Generation

PURIFIED WATER PRODUCTION RATE:

60 GPM

FEED WATER:

350ppm

BANKING:

3-2-1 banked RO system with 3 element long housings

BACKGROUND

The University of New Mexico uses reverse osmosis to pre-treat boiler feed water at their on-site power generation and centralized heating and cooling facility (commonly referred to as co-generating or co-gen). The facility generates 219,000 lbs per hour of steam and up to 14 megawatts of electricity. In the past UNM utilized traditional brackish water 8040 style mesh elements to produce water for these applications. On-site co-generating, heating, and cooling systems are not uncommon among universities, and many around the country have systems like this one. UNM became interested in Aqua Membranes technology and how Printed Spacer elements could improve the efficiency and reliability of their current system and decided to replace their traditional, mesh elements and be one of the first to adopt Printed Spacer Technology®.

The system operates daily, but the run time changes seasonally based on demand. For most of the year, demand is limited to the co-gen plant itself, but during the winter months the system has a longer operating window as the site also provides water to the nearby hospital. For both applications it is important to increase output so the students and community can enjoy the services the facility provides, while lowering the operational burden for the university. Since installing new elements in June of 2022, not only has the system output increased 20% but the window of reliable operation has increased significantly which enables the Utility staff to meet their water demands at with more flexibility.

OUR SOLUTION

Aqua Membranes supplied new BWRO elements with Printed Spacer Technology® to replace the conventional mesh elements the site had been running. These new elements allowed for more membrane surface area per element which provides more output. In addition to increased productivity (output per element), the innovative spacer design saved more than 20psi of wasted pressure compared to the previous elements with mesh spacers.

WHAT MAKES PRINTED SPACERS DIFFERENT?

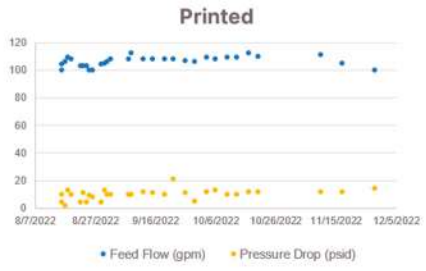
Printed Spacer Technology® is a disruptive innovation in the reverse osmosis industry. Instead of making space in between the membrane sheets with extruded plastic mesh (which has remained nearly unchanged for over 60 years) Aqua Membranes prints features directly on the surface of the membrane. This means that the spacer no longer needs to be interconnected and there are fewer obstructions as the water flows across the membrane. All of this allows for lower wasted energy from differential pressure loss, and more membrane area in each element. Being able to deliver both innovations in the same design is the power of the technology.

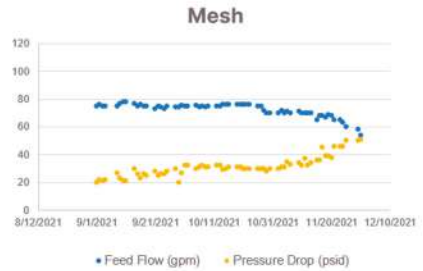
KEY BENEFITS

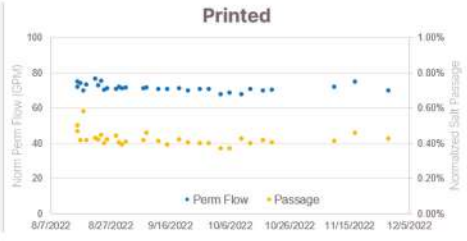
1. **Reduced wasted energy (lower pressure drop)**
2. **Higher productivity (output per element)**
3. **Increased operating window flexibility.**

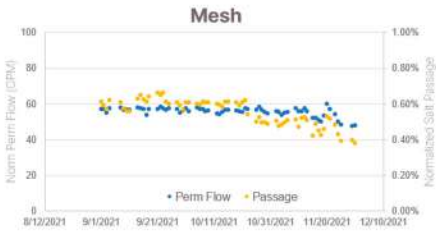
RESULTS

With traditional mesh elements, the system produced 52gpm of permeate. After the installation of Aqua Membranes Conzerv elements the system consistently produces 72gpm. In addition, with Printed Spacer Technology® it now possible to operate the system within a greater window of pressure and permeate outputs. This means that, depending on time of year, the system can be adjusted to better suit the needs of the university as well as the nearby hospital.





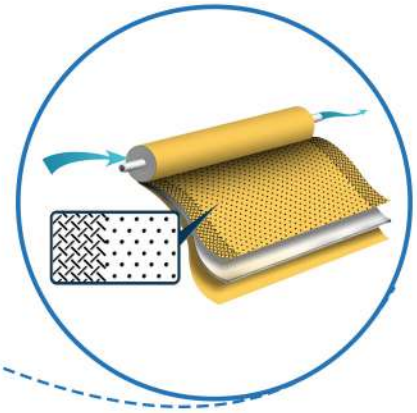




Normalized Rejection

CONCLUSION

Aqua Membranes elements with Printed Spacer Technology® were able to increase the output of the University of New Mexico's reverse osmosis system and add unforeseen benefit by increasing operational window flexibility. Not only is this a success for the University of New Mexico, but it elegantly showcases many of the benefits of Printed Spacer Technology®. Through an increase in surface area and a decrease in wasted energy from feed to reject pressure drop, the existing system has shown the ability to produce more water as the same energy input or produce the same amount of water as conventional elements at a lower overall energy consumption. All while maintaining permeate water quality. After 9 months of run time, UNM is very pleased with its investment. We look forward to seeing how Aqua Membranes elements aid in cleaning cycles, as well as overall element lifespan, and will continue to provide value going forward.



"I WISH WE HAD MORE PLACES TO SEND THE WATER"

University of New Mexico Operator