OPINION

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TREATING WATER THE WAY IT DESERVES TO BE TREATED WITH SILICON CARBIDE MEMBRANES

The majority of the world's population does not have access to clean water and the majority of wastewater is not discharged safely to nature's water bodies. Existing freshwater supplies are under increasing stress due to population growth, industrial use, and pollution. As part of a viable water supply, wastewater isn't fully utilized as such, due to limitations and high costs of conventional technology. In some instances, wastewater is barely treated at all in the form of storm driven sewer discharges. Silicon Carbide (SiC) membranes eliminate many of the limitations associated with conventional water treatment, creating a global opportunity to safely purify and recover water with a fraction of the installation time, footprint and cost.

The current water treatment landscape is typically composed of long, complicated and custom-made treatment schemes, involving numerous treatment steps before water can be reused, discharged or consumed safely. This approach often has a limited operating window and can struggle if inlet water quality deviates from the original basis of design. Resulting in plant down time, un-scheduled maintenance and reduction in quantity and quality of the treated water. For that reason, additional standby capacity is often required adding to the already excessive cost and footprint of the plant.

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The ability of membranes to turn wastewater into safe, clean, reusable water is widely accepted throughout the world but the adaptation rate is slower than it should be. This is because conventional membranes have not always been the most reliable, causing real world costs for advanced reuse to be higher than projected. Many of our water scarcity issues can be resolved if there is a reliable and sustainable technology that makes it easy to turn wastewater into drinking water.

Silicon Carbide (SiC) membranes are providing a new paradigm for water treatment. A truly resilient membrane can only be achieved by completely changing the membrane material itself. Conventional membranes are derived from petroleum oil. SiC is derived from sand from the North Sea. No need to be a membrane expert to understand the difference between those materials. With a step change in membrane material, a much wider operational window can be achieved allowing the system to be truly resilient.

SiC membranes allow for complete recovery after cleaning, indefinite dry storage, high solids tolerance, resistance to coarse material, and pressure washing capabilities are some of the many features that make life easier for the user. SiC is also one of the few membrane materials that is naturally and permanently hydrophilic, meaning organic foulants, including oil, are repelled by the membrane while water is naturally drawn in. This allows it to filter water at up to 10x the flow per unit membrane area compared to conventional membranes.

SiC allows for new ways of thinking about water and wastewater treatment. The days of large, complicated treatment trains using truckloads of chemicals to condition the water with standby capacity, can now become a thing of the past. And in many cases, using SiC, conventional treatment schemes can be reduced to 10% of the footprint, 10% of the chemical use and at least half the energy consumption.

SiC is also the only technology that can instantly purify and disinfect at the onset of a storm. This ensures no matter what time of year or how intense a storm is, SiC can provide a physical barrier to bacteria, pathogens, and solids, ensuring our waterways are clean and safe.

All the water we have is all the water we will have. It is our responsibility to purify, recover, and reuse it wisely. The adoption of SiC Technology has been extremely rapid in all parts of the world due to the vast treatment capabilities it can provide. In just five years, more than 500 million liters of clean and safe water have been delivered throughout the world, but there is a long way to go.