New climate tech patent enables faster reduction of total dissolved solids in wastewater

Algal biofilm wastewater treatment is a renewable energy solution for removing nitrogen, phosphorous, and total dissolved solids from water

SLATER, IA, UNITED STATES, December 10, 2024 /EINPresswire.com/ -- Gross-Wen Technologies (GWT) and the Metropolitan Water Reclamation District of Greater Chicago (MWRD) jointly announced the approval of patent number US12054411B2 for improved methods for the removal of total dissolved solids (TDS) in wastewater. The inventors are Martin A. Gross and Dr. Zhiyou Wen with Gross-Wen Technologies, Thomas Kunetz and Kuldip Kumar with MWRD, and Juan Peng with the Iowa State University Research Foundation.

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> *Martin Gross, co-founder and CEO of Gross-Wen Technologies*

The method and technology patented is a renewable energy solution using GWT's revolving algal biofilm (RAB™) system for cost-effective and environmentally friendly wastewater treatment. The improvements increase the rate of TDS removal by moving an algal biofilm through wastewater and moving the algal biofilm through a gas. It is an enhancement that enables greater reduction of carbon emissions, recovery of nutrients, and improvements in water quality.

This new patent is of critical impact for the wastewater industry. TDS is not just a concern for the Chicago-area MWRD, which serves about 5.19 million citizens. It is an ever-growing concern across the globe. TDS can harm aquatic life and build up in pipes causing corrosion. Another persistent challenge for recovery facilities is how to remove TDS from wastewater streams economically and sustainably. While earlier patents prove the RAB system has the capability to remove TDS, the new patent proves it performs this function at a greater rate than other methods.

“We are thrilled to receive another patent approval for our important technology using algae to solve one of the most challenging problems faced with wastewater,” said Gross, who is the co-founder and chief executive officer of Gross-Wen Technologies. “This new patent approval is another confirmation that the RAB system is a sustainable and environmentally friendly method for wastewater remediation. Our team of scientists and engineers are tenacious and committed to the pursuit of effective climate solutions.”

These climate solutions cannot wait, and GWT is moving swiftly to improve the effectiveness of its RAB technology. In a patent approved on July 4, 2023, and previously announced, the patent protected the novel RAB system for the removal of TDS. This additional patent specifically addresses how the RAB system enhances algae to remove TDS at a faster rate. It is a reliable solution for a wide variety of municipal and industrial applications.
“Our work with Gross-Wen Technologies is exceeding our goal to optimize the wastewater treatment process. “We are on a perpetual quest for greater operational reliability and process performance, reduced energy demand, and improved environmental quality and compliance,” said Kuldip Kumar, a co-inventor and a principal environmental scientist for MWRD.

Supporting the patent were impressive technical results. The new efficiencies of removing TDS, chloride, and other ions by the RAB reactors were higher than those of the suspended algal culture system and depended on the hydraulic retention time. The extracellular polymeric substances (EPS) content of the algal biofilm, particularly the protein and polysaccharides in EPS, was higher in RAB reactors than in suspended culture systems and was responsible for the high TDS removal efficiencies.

“This wastewater treatment marvel in algae harvesting continues to yield multiple benefits that optimize the water reclamation process, leading to cleaner water and lower carbon emissions,” said MWRD President Kari K. Steele. “We applaud our partners from Gross-Wen Technologies and Iowa State University Research Foundation and our scientists at the MWRD for their ingenuity and determination to apply this practice to our treatment process.”
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About Gross-Wen Technologies
Gross-Wen Technologies is a climate and wastewater treatment technology company that uses algae instead of bacteria or chemicals to recover nitrogen and phosphorus from wastewater. During the treatment process, the algae consume CO2, harmful green house gases, from the atmosphere, making algae the most sustainable way to treat wastewater. The algae are later harvested to be used as slow-release fertilizer, in biofuels, or in other products. GWT’s patented algae-based water treatment solution, called the revolving algal biofilm™ system (RAB™), is considered the top algae treatment system in the world. Learn more at algae.com.

About Metropolitan Water Reclamation District of Greater Chicago
Established in 1889, the MWRD is an award-winning, special purpose government agency responsible for treating wastewater and managing stormwater in Cook County, Illinois. In this

capacity, the MWRD strives to be a responsive neighbor that engages with the public on several critical water-related issues that improve the quality of life for all. The MWRD's mission is to protect the health and safety of the public in its service area, protect the quality of the water supply source (Lake Michigan), improve the quality of water in watercourses in its service area, protect businesses and homes from flood damages, and manage water as a vital resource for its service area. The MWRD serves 5.19 million people within Chicago and 128 municipalities that stretch across 882 square miles.
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