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United States Membrane Bioreactor Market Segmented By Membrane Type (Hollow Fiber, Flat Sheet, Multi Tubular), By Configuration (Submerged MBR, External MBR), By Application (Municipal, Commercial, Industrial), By Region, Competition, Forecast and Opportunities, 2028

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Abstracts

United States Membrane Bioreactor Market is predicted to proliferate significantly during the forecast period of 2024-2028. The rising need for water treatment solutions across the nation is the main factor driving the country's market. Freshwater supplies are continually diminishing, consequently, fueling the demand for clean drinking water among consumers. The growing environmental concerns about effective sanitation and wastewater disposal are also boosting the United States membrane bioreactor (MBR) market.

A few other factors that are aiding this country's market are the increased number of residential, commercial, and industrial complexes that presently use MBRs for wastewater and the emergence of buried MBRs. These systems are lightweight, small, cost- and energy-effective, and can aerate to produce tangential liquid flow across the membranes.

Furthermore, the increased use of eco-friendly water and wastewater management technologies in a variety of sectors, including the chemical, pharmaceutical, power, food and beverage, and textile industries, is supporting the market growth. It is anticipated that other factors, such as rapid industrialization and the enforcement of supportive government policies to replace the current wastewater treatment facilities with MBRs, will fuel the growth of the membrane bioreactor market in the United States from 2024

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to 2028.

Industrial and municipal wastewater is treated using a membrane bioreactor. A perm-selective or semi-permeable membrane technology, such as microfiltration (MF) or ultrafiltration, is paired with a suspended growth bioreactor (UF). Vacuum or gravity-driven and pressure-driven systems are the two most used membrane types for MBR systems. They separate the sediments from the sludge concentration while maintaining the position of floating particles. Compared to conventional methods, they are effective against illnesses, such as cryptosporidium and giardia and have regulated biomass retention, improved effluent quality, and a low carbon impact.

MBR is a cutting-edge technology that can manage a variety of water impurities, including nitrogen, bacteria, suspended particles, pathogens, and other contaminants, present in industrial and municipal waste. For the treatment of wastewater, it is better than moving bed biofilm reactor (MBBR) and conventional activated sludge processes (ASP). It is used for microfiltration (MF), ultrafiltration (UF), nanofiltration (NF), and reverse osmosis. As MBRs have smaller reactor diameters and higher sludge concentrations than traditional systems, they create less sludge. Longer solid retention times (SRT) in membrane bioreactors also enable better biological treatment.

Increasing demand for Clean water Boosts Membrane Bioreactor Usage in the United States

The constantly rising population and rapid industrialization have boosted the demand for chemically treated water among consumers needing clean and drinkable water. For instance, between July 2021 and July 2022, the United States’ population expanded by 0.38%, which is somewhat higher than the historically low of 0.16%, recorded during the first year of the COVID-19 pandemic. This population growth has emerged as one of the primary drivers of the country's increased need for clean water, which, eventually, is expected to propel the market in the coming years.

Due to rapid industrialization in the country, the scarcity of freshwater resources has increased, and water quality has also deteriorated which has forced the governments to emphasize water treatment technologies in order to provide clean and usable water. For instance, in 2022, California surfaced as the largest manufacturing state in the United States, employing 1,541,000 workers across 24,304 enterprises. The proliferation of workers in the industrial setting has demanded the requirement of more fresh water, which has stimulated the installation of membrane bioreactors in water treatment plants.

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Rising Application of Membrane Bioreactor Systems

Many water pollutants, including nitrogen, bacteria, pathogens, suspended particles, and other contaminants, that are usually present in municipal and industrial waste, can be managed using MBR systems. Both, the currently employed activated sludge process (ASP) and the moving bed biofilm reactor (MBBR), are less effective in treating wastewater. Microfiltration, ultrafiltration, nanofiltration, and reverse osmosis are frequently carried out in hollow fiber, flat sheet, and multi tubular membrane bioreactors. They provide greater sludge concentrations and lower reactor sizes as compared to traditional systems, which lessens the production of sludge. The market for MBR systems is expected to continue to rise at a high rate due to the growing urbanization and infrastructural development in emerging economies. Additionally, the rising demand for cost-effective and durable goods is likely to drive the United States Membrane Bioreactor market over the forecast period.

Outline of order details

Order received – July 13, 2021

Location - Fulton County, Georgia, USA

Product - Membrane bioreactor wastewater treatment system using Kubota submerged membrane units.

In 2020, Toray Membrane USA Inc and M|MBR Systems LLC, a company that offers flat-sheet membrane bioreactor systems as a service, decided to sign an exclusive supply contract that includes MBR retrofit applications. The new collaboration combines the knowledge of both businesses, provides MBR solutions to the municipal and industrial industries, and focuses on modernizing more established membrane technology.

Challenges:

The operation and maintenance of the mechanical parts of membrane bioreactors, which is a complicated technology, needs technical expertise. Due to the advanced nature of MBR, a skilled and qualified crew is necessary. Apart from this, specialists are also required to manage sophisticated system maintenance as membrane degradation may lead to a significant loss of money. However, there is a shortage of skilled

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workforce, which is well-trained for any health hazards connected to chemical handling and cleaning, for MBR operations. This serves as a huge setback for the United States membrane bioreactor market.

Market Segmentation

The United States Membrane Bioreactor market is analyzed on the basis of Membrane Type, Configuration, and Application. based on the membrane type, the market is divided into hollow fiber, flat sheet, and multi tubular. Based on the configuration, the market is divided into Submerged MBR and External MBR. Based on application, the market is divided into municipal, commercial, and industrial. Regionally, the market is segmented into Northeast, Midwest, West, and South.

Company Profiles

Suez North America, Koch Separation Solutions Inc., Evoqua Water Technologies LLC, Kubota Membrane USA Corporation, Ovivo USA LLC, Veolia Water Technologies Inc., Sperta (USA) Environmental Technology Inc., BioMicrobics Inc., Newterra Ltd., and Pure Aqua Inc. are among the major players that are driving the growth of the United States membrane bioreactor market.

Report Scope:

In this report, the United States membrane bioreactor market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

United States Membrane Bioreactor Market, By Membrane Type:

Hollow Fiber

Flat Sheet

Multi Tubular

United States Membrane Bioreactor Market, By Configuration:

Submerged MBR

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External MBR

United States Membrane Bioreactor Market, By Application:

Municipal

Commercial

Industrial

United States Membrane Bioreactor Market, By Region:

Northeast

Midwest

West

South

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the United States Membrane Bioreactor market.

Available Customizations:

With the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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(Note: The companies list can be customized based on the client requirements.)

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