Gas Separation Membrane Market | Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 150 pages | Mordor Intelligence

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Report description:

The global gas separation membrane market is valued at USD 957.47 million in 2021 and is projected to register a CAGR of 5.87% during the forecast period (2022-2027).

Key Highlights
The major factors driving the market studied are the increasing demand for membranes in carbon dioxide separation processes and strict government norms towards GHG emissions.
On the flipside, plasticization of polymeric membranes in high-temperature applications and growth in shale investment has significantly hindered market growth.
The development of mixed matrix membranes and polymeric membranes and expanding applications are expected to create opportunities for the market studied.
Asia-Pacific represents the largest market and is also expected to be the fastest-growing market over the forecast period, owing to the increasing consumption from countries like China, India, and Japan.

Gas Separation Membrane Market Trends

Hydrogen Recovery Application to Dominate the Market

With the growing demand for clean energy, the demand for hydrogen is growing globally. Hydrogen is extensively used in hydro-treating and hydrocracking for cleaner and higher-value fuels and demand for chemical products and electronics

production. The processes to generate hydrogen create residual gas streams or byproducts that retain a significant amount of valuable pressurized hydrogen. Therefore, gas separation membrane modules are employed to economically recover hydrogen from such gas streams with minimal losses. These membrane modules achieve separations that result in 90 -99.9% of hydrogen purities.
Hydrogen separation and recovery are extensively used during downstream treatment processes at high enough temperatures. The separation membranes are used for hydrogen separation converting natural gas via steam reforming reactions. In this process, methane conversion and hydrogen separation are carried out in a single component. The equilibrium shifting in this case by continuous hydrogen removal increases the degree of chemical conversion, enhancing the overall plant efficiency.
Despite countries growing initiatives toward decarbonization, more than 75% of global energy demand is met through fossil fuels. Unlike fossil fuels, hydrogen as an energy source produces water as the only byproduct. Using hydrogen as an energy source may significantly help address issues related to energy security, global climate change, and air pollution. Furthermore, the abundant availability of hydrogen in the universe contains the highest energy content per unit of weight compared to any known fuels.
Hydrogen is recovered from refinery and petrochemical streams, so it may be used in hydro-treating operations to produce low sulfur fuels. Membranes are used to efficiently recover and recycle hydrogen contained in purge gas to adjust H2 / CO ratio.
According to Global Hydrogen Outlook, 2021, by IEA, based on planned projects and existing plants, global hydrogen production from fossil fuels with carbon capture and storage (CCSU)is expected to reach 9 Mt by 2030. In the United Kingdom, domestic low-carbon hydrogen production capacity is expected to reach 5 GW by 2030
Thus, growing hydrogen production may augment the hydrogen recovery procedures in refining and petrochemicals application, boosting the demand for gas separation membranes.

Asia-Pacific to Dominate the Market

Asia-Pacific is anticipated to account for the largest and the fastest-growing market for gas separation membrane, attributed to growing industrialization in the region, which, in turn, boosts the market growth.
Rising emphasis on CO2 reduction and rising biogas demand in countries such as Indonesia, China, and India are expected to drive market growth.
This growth is driven mainly by the rising demand for carbon dioxide removal from reservoirs, increasing demand for sanitation and fresh water, increasing urbanization, and improved standard of living. Rapid growth and innovation, coupled with industry consolidations, are expected to lead to the rapid growth of the market in the region.
However, The oil and gas sector is one of the largest application industries for gas separation membranes in China. China has been investing to scale up its refining capacity over the past two decades to its growing economy. Moreover, for a long period, China has continuously expanded its refining capacity for all types of crudes. According to Institute for Energy Research, China will likely register 20 million barrels of refining capacity at the end of 2025, which will trigger the demand for gas separation membranes in the upcoming years.
Moreover, the crude oil output of China has registered at 33.47 million tons in the first two months of 2022, which is about 4.6 percent up from the same period of the previous year. According to the National Bureau of Statistics China, the daily output of crude oil is nearly 576,000 tons. Since gas separation membranes are widely used in the oil & gas industry, from oil wellhead to oil recovery to refinery, it will significantly augment product demand shortly.
Increasing biogas production in developing countries, particularly in Asia-Pacific, and the technique's cost-effectiveness, are further boosting the market growth. The presence of numerous reservoirs and rising shale gas production across South East Asian nations are expected to drive global demand for gas separation membranes.
Additionally, the increasing use of gas separation membranes to control CO2 emissions from industrial effluents is expected to have a positive impact. Strengthening government regulations to curb gaseous emissions is expected to fuel the demand for the product in the future.
India sees huge investments from domestic and foreign players in the oil and gas industry. According to the Ministry of Petroleum

and Natural Gas, the country is looking to cut its reliance on oil imports by 10% by 2022. The government is also planning to invest USD 2.86 billion in upstream oil and gas production to double the country's natural gas production to 60 bcm and drill more than 120 exploration wells by 2022. This is expected to create a huge demand for gas separation membranes in the country. Furthermore, significant growth of natural gas production in the region may propel the demand for gas separation membrane in acid gas separation in the regional market.

Gas Separation Membrane Market Competitor Analysis

The gas separation membrane market is partially consolidated in nature, with a few major players dominating a significant portion of the market. Some of the major companies are Air Products Inc., UBE Industries Ltd, Air Liquide, Evonik, and Membrane Technology and Research Inc., among others.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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