

Global Gas Separation Membrane Market 2023

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Abstracts

Description

The global gas separation membrane market reached a value of USD 1.82 billion in 2022 and is projected to grow at a CAGR of 4.6% between 2023 and 2029, reaching USD 2.53 billion by 2029. Gas separation membranes enable industrial separation of gases based on their unique chemical properties and are vital for applications like natural gas purification.

Market growth is driven by rising natural gas demand globally coupled with the energy efficiency benefits of membrane gas separation. While the COVID-19 pandemic resulted in a short-term setback, the market is poised for recovery over the medium to long term.

Key drivers include growing demand for membranes in carbon dioxide separation processes and stringent government regulations around greenhouse gas emissions. However, challenges like plasticization at high temperatures and difficulties scaling up new membrane materials may restrain adoption. Emerging opportunities lie in advanced mixed matrix membranes and expansion into newer end-use applications.

Market Segmentation

The market is segmented based on various factors, including material type, application, and geography.

Segmentation by Material Type

Polyimide and Polyamide

Polysulfone

Cellulose Acetate

Others

Segmentation by Application

Nitrogen Generation and Oxygen Enrichment

Hydrogen Recovery

Carbon Dioxide Removal

Removal of Hydrogen Sulphide

Others

Segmentation by Geography

North America %li%United States, Canada, Mexico

Europe %li%United Kingdom, Germany, France, Italy, and Rest of Europe

Asia-Pacific %li%China, Japan, India, South Korea, and Rest of Asia-Pacific

Latin America %li%Brazil, Argentina, and Rest of Latin America

Middle East and Africa %li%Saudi Arabia, South Africa, and Rest of Middle East and Africa

The gas separation membrane market is partially consolidated, with major players dominating due to the adoption of polyimide and polyaramide materials in the natural gas industry. These materials have excellent properties, driving market growth. Polyimide and polyaramide membranes are widely used for separating gases in applications like nitrogen generation and oxygen enrichment, which contribute to market concentration. These membranes are used in chemical factories to recover valuable gases and combat air pollution. They are also used in various industries, including steel production and medical oxygen concentrators. The market is expected to grow as global

crude steel production recovers and the demand for oxygen concentrators increases.

The Asia Pacific region presents new opportunities for the gas separation membrane market due to growing industrial development and increasing natural gas demand in countries like China, Japan, India, and South Korea. This region is expected to be the largest and fastest-growing market, driven by factors such as carbon dioxide removal, sanitation, freshwater, urbanization, and higher living standards. China's oil and gas industry and increasing refining capacity contribute to the demand for gas separation membranes, while India's power industry grows due to population and electrification. The use of these membranes to control CO₂ emissions and government regulations on emission control further drive market demand. The growth of natural gas production in the region also fuels demand for gas separation membranes in acid gas separation applications.

Competitive Landscape

The gas separation membrane market is partially consolidated, with major players like Air Liquide S.A., Air Products and Chemicals Inc., DIC Corporation, Fujifilm Corporation, Generon IGS Inc., Parker Hannifin Corporation, UBE Corporation.

Recent Industry Developments

UBE Corporation expands polyimide hollow fiber production facilities for gas separation membranes at Ube Chemical Factory. Gas separation membrane module production facilities at Sakai Factory also expand. Aim is to meet CO₂ separation membrane demand. Expected to be operational in first half of fiscal year 2025, increasing production capacity by 1.8 times.

Toray Industries, Inc. develops polymeric separation membrane module that efficiently permeates hydrogen from mixed gases. Reduces CO₂ emissions in hydrogen purification by over 50% compared to conventional methods. Also reduces number of modules needed for purification, potentially revolutionizing hydrogen separation and promoting sustainability.

Why Buy This Report?

Get a detailed picture of the Global Gas Separation Membrane Market

Identify segments/areas to invest in over the forecast period in the Global Gas

Separation Membrane Market

Understand the competitive environment, the market's leading players

The market estimate for ease of analysis across scenarios in Excel format

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