

# **Gas Separation Membrane Market by Module, Material Type, Application (Nitrogen Generation & Oxygen Enrichment, Hydrogen Recovery, CDR, Vapor/Gas Separation, Vapor/Vapor Separation, Air Dehydration, H2S Removal), and Region - Global Forecast to 2030**

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## **Abstracts**

The global gas separation membrane market size is projected to reach USD 1.6 billion by 2030 from USD 1.0 billion in 2023, at a CAGR of 7.4% during the forecast period. The growing demand for clean energy is driving the increased adoption of gas separation membranes. This technology encompasses diverse methods and processes designed to separate various gases from mixtures based on distinctive properties including size, solubility, chemical reactivity, or molecular weight. Gas separation technology finds extensive applications across a spectrum of industries, playing a vital role in processes such as gas purification, environmental conservation, energy generation, and healthcare.

“Spiral wound is the second largest module in terms of value in the gas separation membrane market, in 2022.”

Spiral wound modules play a vital role in gas separation membrane technology, renowned for their effectiveness and flexibility in separating gases. These modules are constructed by tightly winding flat-sheet membrane material around a central tube in a spiral pattern. They offer extensive surface areas for gas separation, facilitating efficient interaction between the gas mixture and the membrane material. This results in high gas throughput, making spiral wound modules ideal for applications handling large gas volumes. Their compact design proves advantageous in space-constrained environments.

“Nitrogen generation & oxygen enrichment accounted for the second largest market share in terms of value in the gas separation membrane market, in 2022.”

Gas separation membranes play a vital role in both nitrogen generation and oxygen enrichment processes. In nitrogen generation, these membranes selectively extract nitrogen from the surrounding air, ensuring the production of high-purity nitrogen used in applications such as food packaging and electronics manufacturing. Conversely, in oxygen enrichment, the gas separation membranes allow only oxygen to permeate through, creating an oxygen-enriched stream essential for healthcare applications such as oxygen concentrators. These membranes enhance the efficiency and dependability of gas production, benefiting industries requiring precise gas compositions for diverse purposes, ranging from industrial processes to medical therapies.

“North America is the second largest region in the gas separation membrane market in 2022.”

In North America, strict environmental regulations aimed at emission reduction and enhancing air quality are prompting industries to embrace gas separation membranes for efficient pollutant capture and separation. Additionally, the region's increasing focus on clean energy sources, propelled by environmental concerns and sustainability objectives, is driving the demand for gas separation membranes. Ongoing advancements in gas separation membrane technology, encompassing material enhancements, design refinements, and manufacturing process improvements, are broadening their utility and bolstering their effectiveness and efficiency. Moreover, gas separation membranes are extensively utilized across diverse sectors in North America, including oil and gas, pharmaceuticals, petrochemicals, and food and beverage industries. This widespread adoption is attributed to their role in gas purification, separation, and recovery processes within these industries.

The breakdown of primary interviews has been given below.

By Company Type: Tier 1 – 25%, Tier 2 – 50%, and Tier 3 – 25%

By Designation: C Level Executives – 20%, Director Level – 30%, Others – 50%

By Region: North America – 20%, Europe – 30%, APAC – 25%, Middle East & Africa – 10%, South America-15%.

The key players in the gas separation membrane market Air Liquide (France), Air Products and Chemicals, Inc. (US), UBE Corporation. (Japan), Honeywell UOP (US), FUJIFILM Manufacturing Europe B.V. (Netherlands), SLB (US), DIC Corporation (Japan), PARKER HANNIFIN CORPORATION (US), Membrane Technology and Research, Inc. (US), and Generon (US) among others. The gas separation membrane market report analyzes the key growth strategies, such as new product launches, investments & expansions, agreements, partnerships, and mergers & acquisitions to strengthen their market positions.

## Research Coverage

This report provides detailed segmentation of the gas separation membrane market and forecasts its market size until 2030. The market has been segmented based on type (polyimide & polyaramide, polysulfone, cellulose acetate), module (spiral wound, hollow fiber, plate & frame), application (nitrogen generation & oxygen enrichment, hydrogen recovery, carbon dioxide removal, vapor / gas separation, vapor / vapor separation, air dehydration, H<sub>2</sub>S), and region (North America, Europe, Asia Pacific, Middle East & Africa, and South America). A detailed analysis of key industry players has been conducted to provide insights into their business overviews, products & services, key strategies, new product launches, expansions, and mergers & acquisitions associated with the market for the gas separation membrane market.

## Key benefits of buying this report

This research report is focused on various levels of analysis — industry analysis (industry trends), market ranking analysis of top players, and company profiles, which together provide an overall view of the competitive landscape; emerging and high-growth segments of the gas separation membrane market; high-growth regions; and market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

Analysis of key drivers (Rising demand for membranes in carbon dioxide separation processes technology, Increasing demand in nitrogen generation and syngas cleaning, Environmental regulations and stringent emission standards), restraints (Technical disadvantages over other gas separation technologies, Plasticization of polymeric membranes in high-temperature applications), opportunities (Development of mixed matrix membranes, Rising demand for clean energy), and challenges (Upscaling and commercializing new

membranes) influencing the growth of the gas separation membrane market.

**Market Penetration:** Comprehensive information on the gas separation membranes offered by top players in the global gas separation membrane market.

**Product Development/Innovation:** Detailed insights on upcoming technologies, research & development activities, and new product launches in the gas separation membrane market.

**Market Development:** Comprehensive information about lucrative emerging markets — the report analyzes the markets for gas separation membrane market across regions.

**Market Diversification:** Exhaustive information about new products, growing geographies, and recent developments in the gas separation membrane market.

**Competitive Assessment:** In-depth assessment of market segments, growth strategies, revenue analysis, and products of the leading market players.

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\*Details on Business Overview, Products Offered, Recent Developments, and MnM View (Key strengths/Right to Win, Strategic Choices Made, and Weaknesses and Competitive Threats) might not be captured in case of unlisted companies.

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