

# **Spiral Membrane Market Forecasts to 2030 – Global Analysis By Type (Nanofiltration (NF) Membranes, Reverse Osmosis (RO) Membranes, Ultrafiltration (UF) Membranes, Microfiltration (MF) Membranes, and Other Types), Material, Technology, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Spiral Membrane Market is accounted for \$9.23 billion in 2024 and is expected to reach \$18.73 billion by 2030 growing at a CAGR of 12.5% during the forecast period. A spiral membrane is a type of filtration technology commonly used in water treatment processes. It consists of a semi-permeable membrane wound in a spiral configuration, which allows for the efficient separation of contaminants from liquids. This design increases surface area, enhancing the filtration process for applications such as reverse osmosis, ultrafiltration, and nanofiltration. Spiral membranes are widely used in industries like water purification, food and beverage, pharmaceuticals, and wastewater treatment due to their high efficiency and compact design.

According to the U.S. Bureau of Labour Statistics, the spending on food showed a decrease of 10.4% in 2020, driven by a fall in the spending for food away from home with a 32.5% decline.

Market Dynamics:

Driver:

Rising demand for water treatment

The need for efficient water filtration solutions has increased as concerns about worldwide water scarcity grow. Spiral membranes are extensively employed in desalination, wastewater treatment, and purification procedures, especially in reverse osmosis (RO) systems. Together with improvements in membrane materials, their effectiveness in eliminating impurities makes them the perfect way to supply safe, clean water. Spiral membrane technology adoption in the water treatment industry is fuelled by this rising demand, which is fuelled by both industrial and municipal needs, especially in areas with limited water supplies.

Restraint:

Limited lifespan of membranes

The efficiency of spiral membranes in filtration operations is decreased as a result of fouling, scaling, and wear over time. Maintaining optimal performance necessitates frequent replacement or cleaning, which raises operating expenses. High water throughput industries or those where a longer membrane lifespan is essential for cost-effectiveness may find this restriction especially difficult to overcome. A major obstacle to spiral membranes' long-term use in several applications is their requirement for frequent maintenance and eventual replacement, even with improvements in membrane materials.

Opportunity:

Growing demand in desalination projects

Seawater desalination has emerged as a key strategy for supplying clean drinking water as freshwater resources grow more limited, particularly in dry areas. Because of their exceptional effectiveness in eliminating salt and impurities from seawater, spiral membranes—especially those found in reverse osmosis (RO) systems—are at the forefront of desalination technology. Population increase, urbanization, and the effects of climate change are further factors driving this need, which in turn is propelling investments in massive desalination facilities across the globe and greatly increasing the use of spiral membrane technology for water purification.

Threat:

Limited adoption in low-income regions

High initial capital investment, installation, and maintenance costs make it difficult for developing countries to implement these advanced filtration systems, especially in areas with constrained budgets. Additionally, the need for specialized technical expertise for operation and maintenance of spiral membrane systems can further limit adoption. As a result, regions with limited infrastructure and financial resources may rely on more affordable, less efficient water treatment technologies, hindering the widespread adoption of spiral membranes despite their potential benefits in addressing water scarcity and pollution.

### Covid-19 Impact

Increased awareness of sanitation and the need for clean water led to a rise in the demand for water treatment solutions, which benefited the spiral membrane market, especially in the municipal and healthcare sectors. The pandemic impacted market growth by causing manufacturing delays, supply chain interruptions, and difficulties installing membrane systems. Large-scale water treatment project cancellations or delays were also caused by budgetary restraints and economic uncertainty in both the public and private sectors, which slowed the pandemic's total market expansion.

The polyamide segment is expected to be the largest during the forecast period

The polyamide segment is expected to account for the largest market share during the forecast period, due to its excellent chemical resistance, high mechanical strength, and efficiency in water filtration. It is commonly used in reverse osmosis membranes for desalination and water purification, offering superior performance in removing salts and contaminants. The growing demand for sustainable water treatment solutions, coupled with polyamide's durability and cost-effectiveness, makes it a preferred material. Additionally, continuous advancements in polyamide membrane technology further enhance its adoption across industries like pharmaceuticals, food processing, and municipal water treatment.

The desalination segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the desalination segment is predicted to witness the highest growth rate. As freshwater resources become increasingly scarce, particularly in arid regions, seawater desalination has emerged as a vital solution for providing clean drinking water. Spiral membranes, especially in reverse osmosis systems, are highly

effective in desalinating seawater due to their efficiency in removing salts and contaminants. The rising global population, urbanization, and climate change concerns further boost investments in desalination projects, driving the demand for advanced membrane technologies like spiral membranes.

Region with largest share:

During the forecast period, Asia Pacific region is expected to hold the largest market share. Countries like China, India, and the Middle East are investing heavily in water treatment technologies, including desalination and wastewater treatment, to address the growing demand for clean water. Additionally, the region's large manufacturing base and expanding food and beverage industries further fuel the adoption of spiral membrane technologies for filtration and separation processes, accelerating market growth in the region.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to increasing demand for advanced water treatment technologies, particularly in desalination, municipal water purification, and industrial applications. Stringent environmental regulations and a strong emphasis on sustainability push industries to adopt efficient filtration systems. The region's investment in infrastructure upgrades, particularly in aging water treatment plants, also boosts the market. Additionally, the growing demand for clean water in agriculture, food and beverage, and pharmaceutical sectors further propels the adoption of spiral membrane technology across North America.

Key players in the market

Some of the key players profiled in the Spiral Membrane Market include Dow Inc., Toray Industries, Inc., LG Chem Ltd., Pentair plc, SUEZ Water Technologies & Solutions, Pall Corporation, Mitsubishi Chemical Corporation, 3M Company, Veolia North America, Parker Hannifin Corporation, General Electric (GE) Water & Process Technologies, Koch Membrane Systems, Inc., Toyobo Co., Ltd., Filtration Group Corporation, Lanxess AG, and Sartorius AG.

Key Developments:

In December 2024, Dow opens announced that it has entered into a definitive

agreement to sell a 40% equity stake in select U.S. Gulf Coast infrastructure assets to a fund managed by Macquarie Asset Management, a leading global infrastructure and energy asset manager.

In November 2024, LG Chem and the extrusion machine manufacturer Reifenhäuser have signed a Memorandum of Understanding (MOU), confirming further extensive cooperation. The aim is to further develop and market competitive Machine Direction Oriented (MDO)-PE blown films and flat films for recyclable packaging. The partners are building on a successful track record: In May 2024, the companies had presented the world's first MDO-PE film only 18 micrometers ( $\mu\text{m}$ ).

#### Types Covered:

Nanofiltration (NF) Membranes

Reverse Osmosis (RO) Membranes

Ultrafiltration (UF) Membranes

Microfiltration (MF) Membranes

Other Types

#### Materials Covered:

Polyethersulfone (PES)

Polyamide

Cellulose Acetate

Polysulfone

Other Materials

#### Technologies Covered:

Membrane Filtration

Electrodialysis

Capacitive Deionization

Applications Covered:

Food & Beverages

Water & Wastewater Treatment

Chemicals & Petrochemicals

Pharmaceuticals

Desalination

Oil Separation

Other Applications

End Users Covered:

Industrial Filtration

Municipal Water Treatment

Residential

Other End Users

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

#### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

#### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

## Contents

### **1 EXECUTIVE SUMMARY**

### **2 PREFACE**

- 2.1 Abstract
- 2.2 Stake Holders
- 2.3 Research Scope
- 2.4 Research Methodology
  - 2.4.1 Data Mining
  - 2.4.2 Data Analysis
  - 2.4.3 Data Validation
  - 2.4.4 Research Approach
- 2.5 Research Sources
  - 2.5.1 Primary Research Sources
  - 2.5.2 Secondary Research Sources
  - 2.5.3 Assumptions

### **3 MARKET TREND ANALYSIS**

- 3.1 Introduction
- 3.2 Drivers
- 3.3 Restraints
- 3.4 Opportunities
- 3.5 Threats
- 3.6 Technology Analysis
- 3.7 Application Analysis
- 3.8 End User Analysis
- 3.9 Emerging Markets
- 3.10 Impact of Covid-19

### **4 PORTERS FIVE FORCE ANALYSIS**

- 4.1 Bargaining power of suppliers
- 4.2 Bargaining power of buyers
- 4.3 Threat of substitutes
- 4.4 Threat of new entrants
- 4.5 Competitive rivalry

## **5 GLOBAL SPIRAL MEMBRANE MARKET, BY TYPE**

- 5.1 Introduction
- 5.2 Nanofiltration (NF) Membranes
- 5.3 Reverse Osmosis (RO) Membranes
- 5.4 Ultrafiltration (UF) Membranes
- 5.5 Microfiltration (MF) Membranes
- 5.6 Other Types

## **6 GLOBAL SPIRAL MEMBRANE MARKET, BY MATERIAL**

- 6.1 Introduction
- 6.2 Polyethersulfone (PES)
- 6.3 Polyamide
- 6.4 Cellulose Acetate
- 6.5 Polysulfone
- 6.6 Other Materials

## **7 GLOBAL SPIRAL MEMBRANE MARKET, BY TECHNOLOGY**

- 7.1 Introduction
- 7.2 Membrane Filtration
- 7.3 Electrodialysis
- 7.4 Capacitive Deionization

## **8 GLOBAL SPIRAL MEMBRANE MARKET, BY APPLICATION**

- 8.1 Introduction
- 8.2 Food & Beverages
- 8.3 Water & Wastewater Treatment
- 8.4 Chemicals & Petrochemicals
- 8.5 Pharmaceuticals
- 8.6 Desalination
- 8.7 Oil Separation
- 8.8 Other Applications

## **9 GLOBAL SPIRAL MEMBRANE MARKET, BY END USER**

- 9.1 Introduction
- 9.2 Industrial Filtration
- 9.3 Municipal Water Treatment
- 9.4 Residential
- 9.5 Other End Users

## **10 GLOBAL SPIRAL MEMBRANE MARKET, BY GEOGRAPHY**

- 10.1 Introduction
- 10.2 North America
  - 10.2.1 US
  - 10.2.2 Canada
  - 10.2.3 Mexico
- 10.3 Europe
  - 10.3.1 Germany
  - 10.3.2 UK
  - 10.3.3 Italy
  - 10.3.4 France
  - 10.3.5 Spain
  - 10.3.6 Rest of Europe
- 10.4 Asia Pacific
  - 10.4.1 Japan
  - 10.4.2 China
  - 10.4.3 India
  - 10.4.4 Australia
  - 10.4.5 New Zealand
  - 10.4.6 South Korea
  - 10.4.7 Rest of Asia Pacific
- 10.5 South America
  - 10.5.1 Argentina
  - 10.5.2 Brazil
  - 10.5.3 Chile
  - 10.5.4 Rest of South America
- 10.6 Middle East & Africa
  - 10.6.1 Saudi Arabia
  - 10.6.2 UAE
  - 10.6.3 Qatar
  - 10.6.4 South Africa
  - 10.6.5 Rest of Middle East & Africa

## **11 KEY DEVELOPMENTS**

- 11.1 Agreements, Partnerships, Collaborations and Joint Ventures
- 11.2 Acquisitions & Mergers
- 11.3 New Product Launch
- 11.4 Expansions
- 11.5 Other Key Strategies

## **12 COMPANY PROFILING**

- 12.1 Dow Inc.
- 12.2 Toray Industries, Inc.
- 12.3 LG Chem Ltd.
- 12.4 Pentair plc
- 12.5 SUEZ Water Technologies & Solutions
- 12.6 Pall Corporation
- 12.7 Mitsubishi Chemical Corporation
- 12.8 3M Company
- 12.9 Veolia North America
- 12.10 Parker Hannifin Corporation
- 12.11 General Electric (GE) Water & Process Technologies
- 12.12 Koch Membrane Systems, Inc.
- 12.13 Toyobo Co., Ltd.
- 12.14 Filtration Group Corporation
- 12.15 Lanxess AG
- 12.16 Sartorius AG

## List Of Tables

### LIST OF TABLES

Table 1 Global Spiral Membrane Market Outlook, By Region (2022-2030) (\$MN)

Table 2 Global Spiral Membrane Market Outlook, By Type (2022-2030) (\$MN)

Table 3 Global Spiral Membrane Market Outlook, By Nanofiltration (NF) Membranes (2022-2030) (\$MN)

Table 4 Global Spiral Membrane Market Outlook, By Reverse Osmosis (RO) Membranes (2022-2030) (\$MN)

Table 5 Global Spiral Membrane Market Outlook, By Ultrafiltration (UF) Membranes (2022-2030) (\$MN)

Table 6 Global Spiral Membrane Market Outlook, By Microfiltration (MF) Membranes (2022-2030) (\$MN)

Table 7 Global Spiral Membrane Market Outlook, By Other Types (2022-2030) (\$MN)

Table 8 Global Spiral Membrane Market Outlook, By Material (2022-2030) (\$MN)

Table 9 Global Spiral Membrane Market Outlook, By Polyethersulfone (PES) (2022-2030) (\$MN)

Table 10 Global Spiral Membrane Market Outlook, By Polyamide (2022-2030) (\$MN)

Table 11 Global Spiral Membrane Market Outlook, By Cellulose Acetate (2022-2030) (\$MN)

Table 12 Global Spiral Membrane Market Outlook, By Polysulfone (2022-2030) (\$MN)

Table 13 Global Spiral Membrane Market Outlook, By Other Materials (2022-2030) (\$MN)

Table 14 Global Spiral Membrane Market Outlook, By Technology (2022-2030) (\$MN)

Table 15 Global Spiral Membrane Market Outlook, By Membrane Filtration (2022-2030) (\$MN)

Table 16 Global Spiral Membrane Market Outlook, By Electrodialysis (2022-2030) (\$MN)

Table 17 Global Spiral Membrane Market Outlook, By Capacitive Deionization (2022-2030) (\$MN)

Table 18 Global Spiral Membrane Market Outlook, By Application (2022-2030) (\$MN)

Table 19 Global Spiral Membrane Market Outlook, By Food & Beverages (2022-2030) (\$MN)

Table 20 Global Spiral Membrane Market Outlook, By Water & Wastewater Treatment (2022-2030) (\$MN)

Table 21 Global Spiral Membrane Market Outlook, By Chemicals & Petrochemicals (2022-2030) (\$MN)

Table 22 Global Spiral Membrane Market Outlook, By Pharmaceuticals (2022-2030)

(\$MN)

Table 23 Global Spiral Membrane Market Outlook, By Desalination (2022-2030) (\$MN)

Table 24 Global Spiral Membrane Market Outlook, By Oil Separation (2022-2030)

(\$MN)

Table 25 Global Spiral Membrane Market Outlook, By Other Applications (2022-2030)

(\$MN)

Table 26 Global Spiral Membrane Market Outlook, By End User (2022-2030) (\$MN)

Table 27 Global Spiral Membrane Market Outlook, By Industrial Filtration (2022-2030)

(\$MN)

Table 28 Global Spiral Membrane Market Outlook, By Municipal Water Treatment (2022-2030) (\$MN)

Table 29 Global Spiral Membrane Market Outlook, By Residential (2022-2030) (\$MN)

Table 30 Global Spiral Membrane Market Outlook, By Other End Users (2022-2030)

(\$MN)

Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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