

# **Advanced Materials for Water Desalination and Purification Market Forecasts to 2032 – Global Analysis By Material Type (Membrane Materials, Adsorbents, Ion Exchange Resins, Catalytic / Photocatalytic Materials and Other Material Types), Treatment Technology, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Advanced Materials for Water Desalination and Purification Market is accounted for \$22.70 billion in 2025 and is expected to reach \$39.15 billion by 2032 growing at a CAGR of 8.1% during the forecast period. An advanced material in water desalination and purification usage is transforming freshwater production worldwide. Materials like graphene membranes, nanomaterials, and specialized polymer composites improve efficiency, selectivity, and longevity in processes such as reverse osmosis, electrodialysis, and nanofiltration. These innovations reduce energy requirements, prevent membrane fouling, and enhance water quality by efficiently removing salts, heavy metals, and pollutants. Incorporating such materials into sustainable water treatment solutions addresses global water scarcity, meets industrial demands, and ensures safe drinking water access for expanding populations. Their development and application are crucial for modern, efficient, and resilient water purification systems.

According to the International Energy Agency (IEA), data shows that global energy demand for desalination is projected to rise significantly, reaching nearly 4,500 petajoules by 2030 under the Stated Policies Scenario, reflecting the growing reliance on advanced membrane and purification technologies to meet water needs.

## **Market Dynamics:**

### **Driver:**

#### **Growing water scarcity**

Increasing freshwater demand, fueled by population growth, urban expansion, and industrial activities, is significantly driving the market for advanced desalination and purification materials. Areas experiencing water shortages are increasingly relying on innovative materials to boost desalination efficiency and water treatment performance. Such materials minimize energy use, improve salt removal, and enhance membrane durability, making water treatment more economical. Public and private investments are rising to secure sustainable water sources. The urgent requirement to mitigate water scarcity is propelling research, development, and widespread implementation of advanced materials in contemporary water purification technologies globally.

### **Restraint:**

#### **High initial capital investment**

The substantial upfront cost of advanced materials and desalination systems is a critical market restraint. Materials such as nanocomposites, graphene, and specialized membranes involve high R&D and manufacturing expenses, making large-scale deployment expensive. Developing countries and smaller municipalities often lack the budget to implement these solutions. Upgrading existing water infrastructure to accommodate new materials adds further expense and complexity. Although long-term operational savings are possible due to energy efficiency and durability, the initial investment deters widespread adoption. Consequently, the high capital requirement continues to hinder the rapid expansion of advanced materials in global water desalination and purification applications.

### **Opportunity:**

#### **Expansion in industrial and municipal applications**

Worldwide industrialization and urban expansion create significant opportunities for using advanced materials in large-scale water purification and desalination. Sectors such as pharmaceuticals, food and beverage, power, and chemicals require high-quality water, increasing demand for effective purification systems. Municipal authorities are

also turning to advanced materials to sustainably address urban water needs. Materials like nanocomposites, polymer membranes, and graphene-based solutions offer high efficiency, lower energy usage, and superior water quality, making them ideal for diverse applications. Integrating these advanced materials into industrial and municipal water infrastructure offers manufacturers and service providers a lucrative chance to strengthen global market presence.

Threat:

High competition and market fragmentation

The market for advanced materials in water desalination and purification is highly competitive and fragmented, representing a major threat. Numerous local and international companies provide varied materials and technologies, creating pricing pressures and limiting profit margins. Rapid innovation may render existing products outdated, increasing risks for suppliers and manufacturers. Smaller companies often find it challenging to compete with established firms that have superior R&D, marketing, and distribution capabilities. This competitive scenario can obstruct market consolidation and slow collaborative efforts. Therefore, high competition and market fragmentation remain significant threats to sustained growth and profitability in the global advanced materials desalination and purification market.

Covid-19 Impact:

COVID-19 significantly influenced the advanced materials market for water desalination and purification. Global supply chain disruptions delayed manufacturing and delivery of essential materials like membranes, nanomaterials, and polymers. Lockdowns and workforce limitations slowed R&D, installation, and maintenance activities, temporarily restricting market expansion. Conversely, the pandemic highlighted the critical need for safe and clean water in healthcare, sanitation, and households, boosting long-term demand. Public and private sectors increasingly focused on efficient water treatment solutions to safeguard health and prevent contamination. While short-term operations were hindered, the pandemic underscored the strategic importance of advanced materials in water purification and reinforced their role in resilient water infrastructure.

The membrane materials segment is expected to be the largest during the forecast period

The membrane materials segment is expected to account for the largest market share

during the forecast period due to their superior efficiency, versatility, and selectivity. These include polymeric, ceramic, and graphene-based membranes, commonly applied in reverse osmosis, nanofiltration, and ultrafiltration processes. They efficiently remove salts, contaminants, and microorganisms while minimizing energy usage, making them ideal for municipal and industrial water systems. Their scalability, durability, and low maintenance requirements drive extensive adoption. Ongoing advancements in membrane technologies, materials, and manufacturing processes continue to reinforce their dominant market position, establishing membrane materials as the foremost segment in the global advanced materials water desalination and purification market.

The nanotechnology-enabled purification segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the nanotechnology-enabled purification segment is predicted to witness the highest growth rate. Leveraging nanomaterials such as carbon nanotubes, graphene oxide, and metal-organic frameworks, these systems improve selectivity, efficiency, and longevity of water treatment processes. They effectively remove salts, heavy metals, microorganisms, and emerging contaminants more precisely than traditional methods. Increasing demand for sustainable and high-performance water treatment, coupled with rising R&D initiatives and adoption in municipal and industrial sectors, is accelerating growth. As a result, nanotechnology-enabled purification represents the most rapidly expanding segment within the global advanced materials water desalination and purification market.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, supported by robust water infrastructure, a strong industrial sector, and substantial R&D investments. The region's focus on sustainable water management, strict environmental regulations, and increasing demand for clean water in municipal and industrial applications encourages adoption of advanced materials. Ongoing innovation in membranes, nanomaterials, and hybrid composites reinforces its leadership. Furthermore, government programs and private collaborations promote high-performance, energy-efficient water treatment systems. These factors collectively make North America the dominant regional market for advanced materials in desalination and purification applications globally.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR. Rapid industrial expansion, population increase, and acute water scarcity are major driving factors. Key countries, including China, India, and Southeast Asian nations, are heavily investing in innovative desalination and water purification technologies to meet escalating municipal and industrial water needs. Advanced membranes, nanomaterials, and hybrid composites are increasingly adopted due to supportive government policies, private investments, and sustainability initiatives. Technological advancements, cost-efficient solutions, and growing awareness of water quality further accelerate adoption, establishing Asia-Pacific as the fastest-growing regional market globally.

### Key players in the market

Some of the key players in Advanced Materials for Water Desalination and Purification Market include Veolia North America, SUEZ Water Technologies & Solutions, Xylem Inc., Aquatech International, IDE Technologies, Doosan Heavy Industries & Construction, Toray Industries, Inc., Acciona Agua, Mitsubishi Heavy Industries, Kurita Water Industries Ltd., Nanostone Water, Membrion, Puraffinity, VA Tech Wabag and Blufox Membranes.

### Key Developments:

In June 2025, SUEZ wins a new contract in Kochi City (India) to upgrade water production and distribution services. The State Government owned Kerala Water Authority (KWA), responsible for the development and regulation of water supply and wastewater management in the southern Indian state of Kerala, awarded SUEZ the contract for Kochi City water supply system upgrade, operations and maintenance, under its Kerala Urban Water Services Improvement Programme.

In June 2025, Aquatech has acquired Singapore-based Century Water, a leader in ultrapure process water and wastewater recycling solutions with a focus on the semiconductor, pharmaceutical and advanced manufacturing sectors. Century will become Aquatech's center of excellence for high-tech industries, with a focus on providing the global semiconductor industry with high-purity water technology, digital services and O&M support.

In February 2024, Veolia North America (VNA) has reached a \$25 million settlement agreement with members of the Flint Water Litigation class, represented by Co-Lead Counsel Mr. Ted Leopold and Mr. Michael Pitt. The agreement also includes payment of

\$1,500 per individual minor claimant represented by class counsel, for a total not to exceed \$1.5 million. It is estimated that this agreement will resolve claims on behalf of more than 45,000 claimants – more than half of the Flint population.

#### Material Types Covered:

Membrane Materials

Adsorbents

Ion Exchange Resins

Catalytic / Photocatalytic Materials

Other Material Types

#### Treatment Technologies Covered:

Reverse Osmosis (RO)

Nanofiltration (NF)

Ultrafiltration (UF)

Microfiltration (MF)

Ion Exchange Process

Advanced Oxidation Processes (AOPs)

Nanotechnology-enabled Purification

Biological Treatment

#### Applications Covered:

Seawater Desalination

Municipal Water Treatment

Industrial Wastewater Treatment

Residential & Commercial Purification

End Users Covered:

Households

Municipal Authorities

Industrial Enterprises

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 2024, 2025, 2026, 2028, and 2032
- 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

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