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Positive Displacement Pumps Materials Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Material Type (Cast Iron, Stainless Steel, Bronze, Alloy Materials, Thermoplastics, Others), By Pump Type (Reciprocating Pumps, Rotary Pumps, Peristaltic Pumps, Diaphragm Pumps, Gear Pumps, Screw Pump), By End User (Oil and Gas Industry, Water and Wastewater Treatment Industry, Chemical Industry, Food and Beverage Industry, Pharmaceutical Industry, Power Generation Industry, Others), By Region & Competition, 2020-2030F

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Abstracts

Market Overview

The Global Positive Displacement Pumps Materials Market was valued at USD 6.92 billion in 2024 and is expected to reach USD 10.21 billion by 2030 with a CAGR of 6.53% during the forecast period.

The Positive Displacement Pumps Materials Market refers to the segment of the industrial pump industry that focuses on the raw materials used in manufacturing positive displacement pumps. These pumps work by trapping a fixed amount of fluid and displacing it through the pump’s mechanism, making them ideal for high-viscosity fluids, slurries, or applications requiring precise flow control. Common materials used in

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these pumps include stainless steel, cast iron, bronze, specialty alloys, thermoplastics, and engineered polymers. Each material is selected based on factors such as chemical compatibility, pressure handling, temperature resistance, and wear tolerance.

This market is rising significantly due to the increasing global demand for reliable and efficient pumping systems across various end-use industries. In the oil and gas industry, the need for durable materials that can withstand corrosive fluids and extreme pressure is driving the use of high-performance metals and alloys. Similarly, in the chemical and pharmaceutical sectors, stainless steel and corrosion-resistant polymers are preferred due to their non-reactive nature and ability to maintain product purity. The water and wastewater treatment industry is another major contributor, where the demand for cost-effective yet robust materials like cast iron and thermoplastics continues to grow.

Additionally, the rising emphasis on energy efficiency and sustainability is encouraging manufacturers to innovate with lightweight and recyclable materials that offer superior strength and reduced environmental impact. Advancements in material science, such as the development of composite materials and engineered plastics, are also expanding the scope and functionality of positive displacement pumps, allowing them to perform in more diverse and challenging conditions. The growth of infrastructure development, increasing automation in industrial processes, and stringent environmental regulations further support market expansion.

With rapid industrialization in emerging economies, particularly in Asia Pacific and Latin America, and the modernization of existing facilities in developed regions, the demand for advanced pump materials is expected to rise steadily. The market is likely to see strong growth as industries seek more durable, efficient, and sustainable pumping solutions tailored to their evolving operational needs.

Key Market Drivers.

Increasing Demand from Oil and Gas Exploration

The Positive Displacement Pumps Materials Market is significantly driven by the escalating demand from the oil and gas exploration sector, where positive displacement pumps are critical for handling high-viscosity fluids, such as crude oil and drilling muds, under high-pressure conditions. Materials like stainless steel, duplex steel, and advanced polymers, such as PTFE and PEEK, are essential for manufacturing pump components that withstand corrosive environments, abrasive fluids, and extreme

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temperatures encountered in upstream exploration and production.

The global push for energy security, particularly in regions like North America and the Middle East, has led to increased drilling activities in shale and offshore fields, necessitating robust, durable pumps. These pumps, including screw, gear, and progressive cavity types, rely on high-performance materials to ensure operational efficiency and longevity in harsh conditions. The rise in unconventional oil and gas extraction, such as hydraulic fracturing, further amplifies the need for materials that resist wear and chemical degradation.

Innovations in material science, such as corrosion-resistant alloys and composite coatings, are enhancing pump performance, enabling them to handle complex fluids with minimal maintenance. The demand for precise metering and consistent flow in oil and gas processes underscores the importance of specialized materials, driving market growth. As global energy consumption rises, particularly in emerging economies, the Positive Displacement Pumps Materials Market is poised for sustained expansion, fueled by the sector’s reliance on high-quality materials to meet operational demands in challenging environments.

The International Energy Agency reported that global oil production reached 102 million barrels per day in 2024, with 65% from unconventional sources requiring positive displacement pumps. Approximately 12 million tons of specialized materials, including 8 million tons of stainless steel and 2 million tons of advanced polymers, were used in 2024 for pump manufacturing in oil and gas applications, based on industry production estimates.

Key Market Challenges

High Cost of Advanced Materials and Manufacturing Complexity

One of the primary challenges in the Positive Displacement Pumps Materials Market is the high cost associated with sourcing and processing advanced materials. Materials such as stainless steel, titanium alloys, high-performance composites, and specialty polymers offer superior durability, corrosion resistance, and temperature tolerance. However, their extraction, refinement, and fabrication involve complex and energy-intensive processes that significantly drive up the overall cost of production. Manufacturers must invest in advanced casting, machining, and treatment technologies to meet strict quality and performance standards, further elevating capital expenditures.

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This high material and production cost can limit market competitiveness, especially in price-sensitive industries such as water treatment or agriculture, where cost-efficiency often takes precedence over longevity or specialized performance. Small- and medium-scale pump manufacturers may find it financially unfeasible to integrate advanced materials into their product lines, leading to limited adoption across segments. Additionally, the requirement for specialized labor, tooling, and testing infrastructure adds to operational costs, posing a significant barrier to entry for new market players.

Furthermore, fluctuations in raw material prices, particularly metals and rare earth elements, driven by geopolitical tensions, supply chain disruptions, and trade policies, introduce cost volatility that affects planning and pricing strategies. This unpredictability can hinder long-term investment in material research and innovation. As industries increasingly demand high-performance pumps for aggressive media and high-pressure applications, balancing cost-effectiveness with performance becomes a persistent challenge. Without breakthroughs in cost-effective material alternatives or scalable production methods, the Positive Displacement Pumps Materials Market may face limitations in achieving broader penetration, particularly in emerging markets.

Key Market Trends

Rising Adoption of Corrosion-Resistant Alloys and Composite Materials

One of the most notable trends in the Positive Displacement Pumps Materials Market is the increasing preference for corrosion-resistant alloys and advanced composite materials. Industries such as oil and gas, chemical processing, and marine operations require materials that can endure highly corrosive fluids, fluctuating temperatures, and aggressive chemicals over prolonged periods. In response, manufacturers are shifting from traditional cast iron and basic stainless steel to more specialized alloys such as duplex and super duplex stainless steel, titanium, Hastelloy, and Inconel.

These high-performance metals provide exceptional resistance to pitting, crevice corrosion, and stress corrosion cracking, especially in chloride-rich and acidic environments. As positive displacement pumps are often exposed to extreme operational conditions, the reliability and longevity of these alloys significantly reduce maintenance costs and enhance equipment life cycles. Alongside metallic innovations, there is growing interest in non-metallic composite materials and advanced polymers. Fiber-reinforced plastics, polytetrafluoroethylene, and perfluoroalkoxy polymers are gaining momentum due to their excellent chemical compatibility, lightweight properties, and ease of molding into complex geometries.

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This trend is further accelerated by the demand for energy-efficient and lightweight systems in sectors like water treatment, food and beverage processing, and pharmaceuticals. Composite materials reduce overall pump weight, which improves energy efficiency and reduces strain on pump components. However, manufacturers must balance material innovation with considerations of regulatory compliance, especially in hygiene-critical applications.

As research and development investment increases in material science, this trend is expected to expand further, offering greater customization, hybridization, and performance scalability. The transition toward corrosion-resistant alloys and composite materials highlights the market's focus on delivering durable, application-specific, and sustainable solutions to meet evolving industry requirements.

Key Market Players

Grundfos Holding A/S

Xylem Inc.

Flowserve Corporation

SPX Flow, Inc.

ITT Inc.

Alfa Laval AB

IDEX Corporation

Dover Corporation

Ebara Corporation

Sulzer Ltd.

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In this report, the Global Positive Displacement Pumps Materials Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Positive Displacement Pumps Materials Market, By Material Type:

Cast Iron

Stainless Steel

Bronze

Alloy Materials

Thermoplastics

Others

Positive Displacement Pumps Materials Market, By Pump Type:

Reciprocating Pumps

Rotary Pumps

Peristaltic Pump

Diaphragm Pumps

Gear Pumps

Screw Pumps

Positive Displacement Pumps Materials Market, By End User:

Oil and Gas Industry

Water and Wastewater Treatment Industry

Chemical Industry

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- Food and Beverage Industry
- Pharmaceutical Industry
- Power Generation Industry
- Others

Positive Displacement Pumps Materials Market, By Region:

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - Germany
  - France
  - United Kingdom
  - Italy
  - Spain
- South America
  - Brazil
  - Argentina
  - Colombia

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- Asia-Pacific
  - China
  - India
  - Japan
  - South Korea
  - Australia
- Middle East & Africa
  - Saudi Arabia
  - UAE
  - South Africa

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Positive Displacement Pumps Materials Market.

Available Customizations:

Global Positive Displacement Pumps Materials Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

- Detailed analysis and profiling of additional market players (up to five).

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