

India Phosphoric Acid Market By Grade (Technical, Fertilizer), By Application (Fertilizers, Pharmaceutical, Food & Beverage, Detergent, Metal Treatment, Water Treatment, Others), By Region, Competition, Forecast & Opportunities, 2020-2030F

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Report description:

India Phosphoric Acid Market was valued at USD 2.60 Billion in 2024 and is expected to reach USD 3.08 Billion by 2030 with a CAGR of 3.07% during the forecast period. Phosphoric acid is classified as a weak acid with the chemical formula H_3PO_4 , commonly known as orthophosphoric acid or phosphoric(V) acid. In its purest state, this chemical appears as a colorless solid. It is a non-toxic acid that remains solid at room temperature and pressure. Primarily utilized in the production of fertilizers, phosphoric acid also finds application in cleaning products, food additives, and water treatment. It serves as a versatile compound, serving purposes such as plant feeding, pH adjustment, and cleaning irrigation equipment from lime precipitation. As a key component in numerous fertilizers, phosphoric acid is predominantly employed in the production of phosphate compounds. Two widely adopted methods for its production are the wet process and the thermal process. While wet process phosphoric acid is commonly used in fertilizer manufacturing, the thermal process yields a purer form suitable for high-grade chemicals, pharmaceuticals, detergents, food, beverages, and other non-fertilizer applications. Noteworthy applications of phosphoric acid include rust removal, personal care products, its incorporation in the food and beverage industry, agricultural practices, pharmaceutical applications, and various other uses.

Key Market Drivers

Growing Demand of Phosphate Fertilizers

With the global population soaring and agricultural productivity becoming a paramount concern, the demand for effective and efficient fertilizers is on the rise. Among these, phosphate fertilizers play a pivotal role in enhancing crop yields and ensuring food security. This surge in demand for phosphate fertilizers has significantly impacted the phosphoric acid market in India, propelling its growth and shaping its future trajectory. Ensuring food security for this burgeoning population necessitates increased agricultural output. Phosphate fertilizers, with their ability to promote healthy root development, aid in energy transfer, and stimulate overall plant growth, are invaluable tools in achieving higher yields and bridging the gap between food demand and

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supply. As the Indian agricultural landscape evolves, there is a growing emphasis on crop diversification and sustainable farming practices.

In February 2024, India aims to finalize a long-term contract with Mauritania for the import of rock phosphate, a crucial component in fertilizer production, due to disruptions in supply and increased global prices resulting from the Ukraine conflict and the Red Sea crisis. India is actively seeking reliable fertilizer suppliers in light of the recent union budget, which allocated a substantial USD 20 billion for fertilizer subsidies. Over the past two years, India has already established long-term agreements with Morocco, Senegal, Israel, Oman, Canada, Saudi Arabia, and Jordan.

Crop rotation and diversified cultivation require tailored nutrient management strategies. Phosphate fertilizers, as a source of essential phosphorus, are central to maintaining soil fertility and supporting the nutrient requirements of a wide range of crops. This diversification trend is expected to drive the demand for phosphate fertilizers and subsequently impact the phosphoric acid market positively. India's position as a significant player in the global agricultural market further amplifies the impact of phosphate fertilizer demand on the phosphoric acid market. As both a consumer and producer of phosphate fertilizers, India's demand can influence global market dynamics. The country's increasing requirement for phosphoric acid, a key ingredient in the production of phosphate fertilizers, has a ripple effect on the international trade of phosphoric acid and related products. As agricultural practices continue to evolve with technological advancements and sustainable initiatives, the phosphoric acid market is set to play an increasingly crucial role in India's journey towards agricultural self-sufficiency and prosperity.

Growing Demand of Water Treatment

With the rise of industrialization and urbanization, water bodies in India are facing unprecedented pollution levels. Agricultural runoff, industrial effluents, and improper waste disposal have resulted in the contamination of rivers, lakes, and groundwater sources. Phosphoric acid, known for its efficacy in removing heavy metals and other pollutants from water, plays a crucial role in water treatment systems. Its ability to bind with contaminants and facilitate their removal through precipitation or filtration makes it a valuable asset in restoring water quality. The need to provide safe and potable water to growing urban populations necessitates robust treatment processes. Phosphoric acid is utilized in various treatment methods, including coagulation and flocculation, to facilitate the removal of suspended particles and impurities from water. Its role in enhancing the efficiency of these processes is driving its demand in municipal water treatment plants across the country. Industries, ranging from power generation and mining to chemical manufacturing, heavily rely on water for their operations. However, the discharge of industrial wastewater often contains harmful contaminants that can have detrimental effects on the environment.

Phosphoric acid-based treatments aid in reducing the levels of pollutants in industrial effluents, enabling companies to meet stringent environmental regulations. Its use in neutralizing acidic effluents and controlling pH levels further highlights its significance in industrial water treatment. As freshwater sources become scarcer, desalination is gaining prominence as an alternative source of potable water. However, the desalination process requires effective treatment to ensure the removal of salts and other impurities from seawater. Phosphoric acid helps control scaling and fouling in desalination systems, thereby enhancing their efficiency and longevity. The water treatment industry is witnessing a surge in technological advancements aimed at improving treatment processes and efficiency. These innovations also impact the demand for phosphoric acid. New formulations and methods utilizing phosphoric acid are continuously being developed to address evolving water treatment challenges. This innovation-driven demand is likely to further shape the phosphoric acid market in India.

Growing Demand of Phosphoric Acid from Pharmaceutical Industry

Phosphoric acid is an inorganic acid widely utilized across various industries due to its colorless and odorless properties. In the pharmaceutical sector, it plays multiple crucial roles, contributing significantly to the development of essential medicines and treatments. One of its primary applications is as a pH adjuster in drug formulations. Precise pH levels are essential for optimal stability, solubility, and efficacy of many pharmaceutical compounds. Therefore, phosphoric acid's ability to fine-tune pH is invaluable in a variety of pharmaceutical formulations, including oral medications and injectables. The buffering capacity of phosphoric acid is vital for maintaining drug stability and bioavailability. It helps prevent rapid changes in pH that could potentially degrade active pharmaceutical ingredients (APIs). This is particularly crucial for oral medications, which need to survive the acidic environment of the stomach before being absorbed in the intestines. Many APIs exhibit poor solubility in water, which can hinder their absorption and effectiveness.

Phosphoric acid's solubilizing properties assist in enhancing the solubility of these compounds, facilitating their incorporation into

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formulations, and improving therapeutic outcomes. Furthermore, phosphoric acid's ability to form stable complexes with metal ions finds applications in drug development. Chelation and complexation processes involving phosphoric acid can enhance the stability, safety, and bioavailability of pharmaceutical compounds, enabling targeted and controlled drug delivery. In pharmaceutical formulations, phosphoric acid derivatives, such as sodium phosphate salts, are widely used as excipients. These salts contribute to the stabilization of emulsions, act as electrolytes, and assist in controlling osmotic pressure in intravenous solutions. Additionally, phosphoric acid plays a role in the production of nutraceuticals and dietary supplements. It promotes bone health and aids in calcium absorption. The increasing prevalence of chronic diseases and the rising need for affordable healthcare solutions further stimulate the demand for innovative pharmaceutical formulations, thus driving the demand for phosphoric acid.

Key Market Challenges

Growth in Environmental Concerns

One of the key environmental challenges posed by the phosphoric acid industry is the potential for water pollution and contamination. Phosphoric acid production involves the extraction of phosphate rock, generating significant amounts of waste called phosphogypsum. This waste may contain harmful pollutants, including heavy metals, radionuclides, and fluoride compounds. Improper management of these pollutants can result in their entry into water bodies, impacting aquatic ecosystems and potentially endangering human health through contaminated water supplies. Moreover, the manufacturing process of phosphoric acid is energy-intensive and often relies on fossil fuel combustion, leading to the emission of greenhouse gases such as carbon dioxide, thereby contributing to global climate change. Additionally, the processing of phosphate rock can release sulfur dioxide and particulate matter into the air, causing air pollution and respiratory health issues for nearby communities. As India strives to achieve its climate goals and reduce air pollution, addressing the emissions from the phosphoric acid industry becomes a significant challenge. The energy and resource-intensive nature of the phosphoric acid manufacturing process, primarily relying on non-renewable sources, further exacerbates carbon emissions and strains already stressed energy systems. Additionally, concerns arise regarding the extraction of phosphate rock, a finite resource, raising questions about resource depletion and long-term industry sustainability. While the primary application of phosphoric acid is in fertilizers, which play a crucial role in enhancing agricultural productivity, improper usage and management of these fertilizers can lead to soil degradation and nutrient imbalances. Overuse or inefficient application of phosphorus-rich fertilizers can result in phosphorus runoff, contaminating water bodies and causing eutrophication. This phenomenon can harm aquatic ecosystems by promoting excessive algae growth, leading to oxygen depletion and die-offs of aquatic life.

Disruption in Supply of Phosphate

Phosphate reserves are concentrated in a limited number of countries, and geopolitical tensions in these regions can result in supply uncertainties. Political instability, trade restrictions, and export bans can affect the availability of phosphate resources for importing countries such as India. Furthermore, the mining and processing of phosphate rock can have significant environmental consequences, including habitat destruction, water pollution, and carbon emissions. Stricter environmental regulations in phosphate-producing countries may impact production levels and exports. The depletion of high-quality phosphate reserves is a major concern as the remaining reserves often have lower phosphate content and necessitate more energy-intensive processing methods. This leads to higher production costs and potential supply constraints. The global demand for phosphate-based fertilizers is increasing due to the growing global population and agricultural needs. This heightened demand, along with supply disruptions, can strain the availability of phosphoric acid and related products. Moreover, the global supply chain for phosphate involves intricate transportation and logistics networks. Disruptions in shipping, port closures, and other transportation-related challenges can affect the timely delivery of phosphate resources to India.

Key Market Trends

Growth in Technological Advancements

Technological advancements have brought about a revolution in quality control and testing within the phosphoric acid industry. The utilization of automation, data analytics, and sensor technologies has enabled the monitoring and assurance of product quality, resulting in improved efficiency and reduced variability. Real-time monitoring allows manufacturers to quickly identify deviations from desired parameters and make timely adjustments, thereby enhancing overall product quality. The integration of digital technologies is reshaping the entire value chain of the phosphoric acid market. Internet of Things (IoT) devices, sensors, and data analytics are being deployed to optimize production processes, monitor equipment health, and track supply chain

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operations.

In December 2023, IFDC, ZFHL, and PPL celebrated the signing of a Memorandum of Understanding (MoU). This MoU outlines the creation of the Fertilizer Innovation Centre of India (FIC-India), aimed at advancing fertilizer innovations and delivering them directly to farmers. The agreement between IFDC, a global leader in phosphate fertilizers; ZFHL, a top Indian agritech firm; and PPL, a leading fertilizer manufacturer and distributor, is designed to promote healthier soils and a better environment, enhancing both human health and agricultural sustainability. Through this partnership, IFDC plans to position India as a key research and development hub for creating efficient nutrient sources and production technologies to improve nutrient use efficiency. AI-driven predictive maintenance ensures minimal downtime and increased productivity. Furthermore, data-driven insights facilitate informed decision-making, aiding in identifying market trends and adapting to changing consumer preferences. Advancements in technology enable the customization of phosphoric acid products to meet specific application needs. Companies are leveraging advanced chemical engineering techniques to develop phosphoric acid with varying concentrations, purities, and characteristics tailored for different industries. This customization enhances product efficacy and expands application possibilities in agriculture, food processing, and industrial sectors.

Segmental Insights

Grade Insights

Based on Grade, Fertilizer have emerged as the fastest growing segment in the India Phosphoric Acid Market in 2024. India's economy heavily relies on agriculture, with a significant portion of the population engaged in farming and related activities. Agriculture plays a vital role in the country's GDP and provides livelihoods for millions of people. Phosphate fertilizers, derived from phosphoric acid, are crucial for replenishing soil nutrients and enhancing crop yields. Phosphoric acid serves as a primary component in the production of phosphate fertilizers such as diammonium phosphate (DAP) and single superphosphate (SSP). These fertilizers supply essential nutrients like phosphorus to the soil, which is necessary for proper plant growth, root development, and overall improvement in crop yield.

Application Insights

Based on Application, Water Treatment have emerged as the dominating segment in the India Phosphoric Acid Market during the forecast period. Phosphoric acid is renowned for its exceptional corrosion inhibition properties. In the realm of water treatment, it finds widespread use in controlling corrosion in pipelines, tanks, and other equipment exposed to water. As India's water infrastructure undergoes expansion and modernization, the importance of effective corrosion control cannot be overstated. The capacity of phosphoric acid to mitigate corrosion significantly contributes to the longevity of water treatment infrastructure, leading to reduced maintenance costs and ensuring the safety of the water supply. Moreover, phosphoric acid plays a pivotal role in water treatment by aiding in the removal of impurities such as metals and other contaminants. It forms complexes with metal ions, facilitating their elimination through precipitation or filtration. This aspect holds particular significance in industries where effluents must comply with stringent discharge standards to prevent environmental pollution.

Regional Insights

Based on Region, West India have emerged as the dominating region in the India Phosphoric Acid Market in 2024. Phosphoric acid is primarily derived from phosphate rock, a crucial resource in its production. If the West Indian regions possess substantial phosphate rock reserves or access to phosphate mines, it could facilitate local phosphoric acid production, potentially leading to market dominance. The presence of a well-established infrastructure and a supportive industry ecosystem can significantly contribute to the dominance of companies in a particular region. This ecosystem encompasses factors such as research and development facilities, a skilled workforce, transportation networks, and manufacturing facilities.

Key Market Players

- Budenheim India Pvt. Ltd.
- Grasim Industries Limited
- Gujarat Alkalies and Chemicals Ltd.
- Indo Maroc Phosphore S.A (IMACID)
- Jordan India Fertilizer Company LLC
- Punjab Chemicals And Crop Protection Limited
- UPL Limited

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Report Scope:

In this report, the India Phosphoric Acid Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

□ India Phosphoric Acid Market, By Grade:

- o Technical
- o Fertilizer

□ India Phosphoric Acid Market, By Application:

- o Fertilizers
- o Pharmaceutical
- o Food & Beverage
- o Detergent
- o Metal Treatment
- o Water Treatment
- o Others

□ India Phosphoric Acid Market, By Region:

- o North India
- o East India
- o West India
- o South India

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the India Phosphoric Acid Market.

Available Customizations:

India Phosphoric Acid 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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