Infomerics Valuation And Rating Pvt. Ltd.
SEBI REGISTERED / RBI ACCREDITED / NSIC EMPANELLED
CREDIT RATING AGENCY

Mr. Vipin Malik
(Chairman, Infomerics Ratings)

Dr. Manoranjan Sharma
(Chief Economist)

Mr. Sankhanath Bandyopadhyay
(Economist)

Mr. Athar Imam Raza
(Officer - Economic Analysis)

INDUSTRY OUTLOOK

INDIA'S RESIN INDUSTRY OUTLOOK 2024: GROWTH AND CHALLENGES

11 June 2024

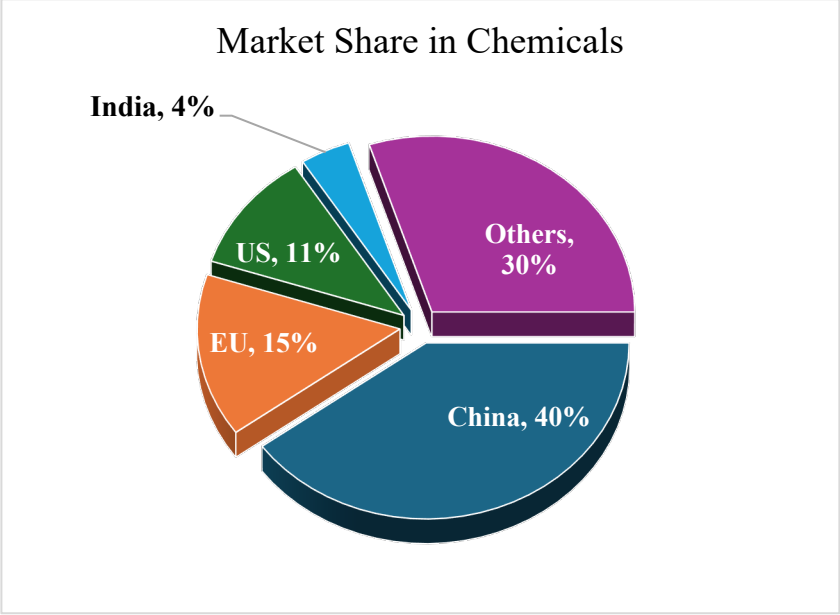
Introduction

The chemical and petrochemical industry in India is integral to the country's manufacturing sector and economic growth, playing a crucial role in meeting basic needs and enhancing the quality of life. With numerous direct and indirect linkages to industrial segments, such as, agriculture, food and beverages, textiles, rubber, and petroleum refining, this industry holds an indispensable position. The chemical industry is, therefore closely related to the manufacturing sector's Index for Industrial Production (IIP).

Ranked 6th globally in chemical production, 3rd in Asia, and 14th in exports, India's chemical sector is a vital hub for industries, such as, textiles, paper, paints, pharmaceuticals, and agrochemicals.[1] In 2024, the Chemicals market is expected to employ one million people, with a projected compound annual growth rate (CAGR) of 3.19 per cent from 2024 to 2029. The employment rate is anticipated to be 0.07 per cent, while labour efficiency and productivity are projected to reach US$143,000 and US$29,700, respectively.

The Indian chemical industry, which is the sixth largest globally and the fourth largest in Asia, is poised to significantly contribute to the GDP, targeting $383 billion by 2030 with a growth rate of 10 per cent CAGR from 2022-2030. Market share of India in chemical production is 4 per cent of the world production of chemicals (see Chart 1).

Chart 1: Market Share in Chemicals by Countries and Regions



Major market players include Aditya Birla Chemicals, Atul Ltd., KUKDO Chemical Co. Ltd, Hexion, and Huntsman International LLC.

Resins often derived from petrochemicals—a major sub-sector of the Indian chemical industry—creates a strong internal linkage, where growth in one sector fuels the other. Resins, extracted from the secretions of plants and trees, are solid or semi-solid amorphous products of complex chemical nature containing many carbon atoms. They can be categorized into two types based on their synthesis: natural and synthetic. In India, natural resin production primarily occurs in Uttarakhand and Himachal Pradesh.

There are several manufacturing firms producing variety of synthetic resins in the country. Resins can be categorized based on their preparation into two main types: thermoplastic resins and thermosetting resins.

Thermoplastic Resins: These resins soften when heated and harden upon cooling, allowing them to be reshaped multiple times. Common examples include polyethylene, polypropylene, polyvinyl chloride, and chlorinated rubber. Specific types include:

- *Alkyd Resins*: Produced by heating polyhydric alcohol with polybasic acids, they offer excellent electrical and thermal properties, chemical resistance, and cost-effectiveness, making them ideal for electric components, paints, and putty fillers.
- *Polycarbonate Resins*: Made from bisphenol A and phosgene, these resins have a high refractive index, stain resistance, and stability, used in metal replacements, lenses, safety helmets, and photography film.
- *Polypropylene Resins*: BPA-free, colourless, tasteless resins with high heat resistance and low density, used in toys, pipes, and coatings.

Thermosetting Resins: Unlike thermoplastics, these resins form irreversible bonds during the curing process, making them unable to be remoulded. Examples include urea, melamine, and phenolic resins. Specific types include:

- *Phenolic Resins*: Known for their heat and impact resistance, these resins are used in brake linings, electrical components, moulds, and adhesives.
- *Polyester Resins*: Formed by the reaction of polyhydric alcohols and dibasic organic acids, they are heat and chemical resistant, used in construction, fishing rods, decorative accessories, and transport components.
- *Epoxy Resins*: These reactive prepolymers have excellent adhesive properties and resistance to chemicals and heat, making them suitable for laminates, linings, propellers, and surface coatings.

Types of Resin Produced in India

In India, various types of resin are produced, including:

- Epoxy Resins: Widely used in paints and coatings, adhesives, sealants, and composites.
- Polyester Resins: Commonly used in the production of fiberglass-reinforced plastics, surface coatings, and castings.
- Phenolic Resins: Utilized in the production of laminates, moulded products, and as a binding agent in foundry and refractory materials.
- Acrylic Resins: Employed in paints, coatings, adhesives, and sealants.

- Polyurethane Resins: Used in foams, elastomers, adhesives, and coatings.
- Alkyd Resins: Predominantly used in paints, varnishes, and enamels.
- Urea-Formaldehyde Resins: Utilized in adhesives, finishes, and moulded objects.
- Melamine-Formaldehyde Resins: Commonly used in laminates, adhesives, and surface coatings.
- Silicone Resins: Used in high-temperature coatings, electrical insulation, and water-repellent coatings.
- Natural Resins: Such as rosin, obtained from pine trees, used in adhesives, inks, and varnishes.

These resins are essential for various industrial applications and contribute significantly to the manufacturing sector in India.

There is a huge market specifically for epoxy resins in India. Production of epoxy resins is essential for the manufacturing of a variety of products such as paints and coatings, adhesives, and sealants, etc.

An elaborate network of institutional mechanism for infrastructure development has strengthened in the last 10 years, with the government of India spending a large chunk of capital expenditure on infrastructure. The growing construction industry and increasing demand for adhesives and sealants from the automotive industry are the factors driving resin market growth.

Global Market Overview

The market for Indian epoxy resin is experiencing robust growth due to its extensive application across various industries, such as, construction, woodworking, and manufacturing. Epoxy resins are highly valued for their strong adhesive properties, chemical and moisture resistance, and moderate temperature tolerance.

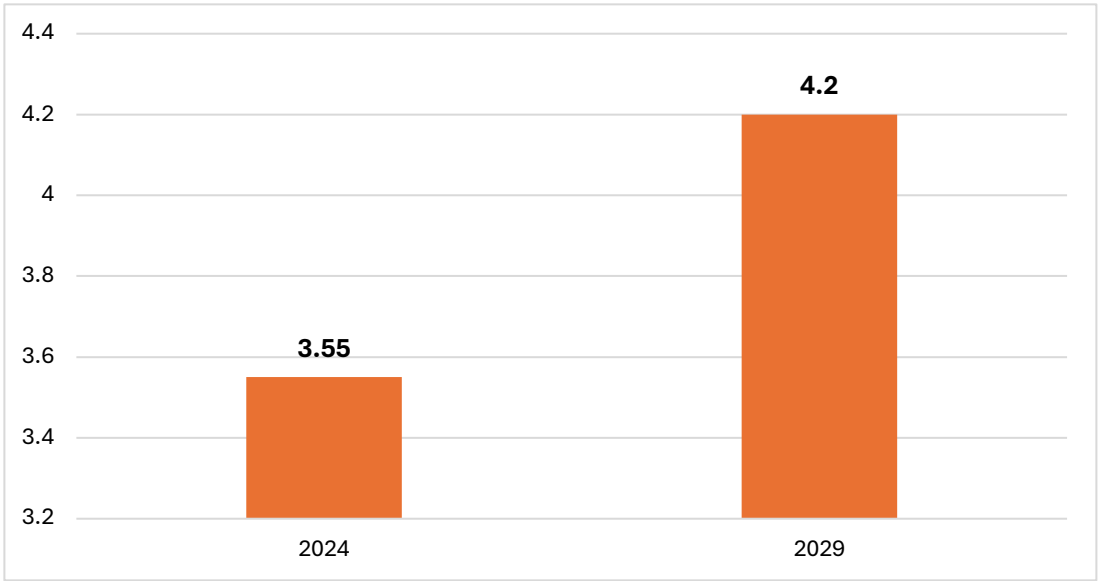
Market Share Analysis

- Paints and coatings dominate the market with a 37.7 per cent share in 2023.
- *Solid* epoxy resin holds the largest market share at 52.1 per cent, known for its durability and versatility.[2]

The Epoxy Resins Market size is estimated at 3.55 million tons in 2024 and is expected to reach 4.20 million tons by 2029, growing at a CAGR of 3.41 per cent during the forecast period (2024-2029)[3] (see Chart 2).

Chart 2: Global Market Size for Epoxy Resins

(Million tonnes)



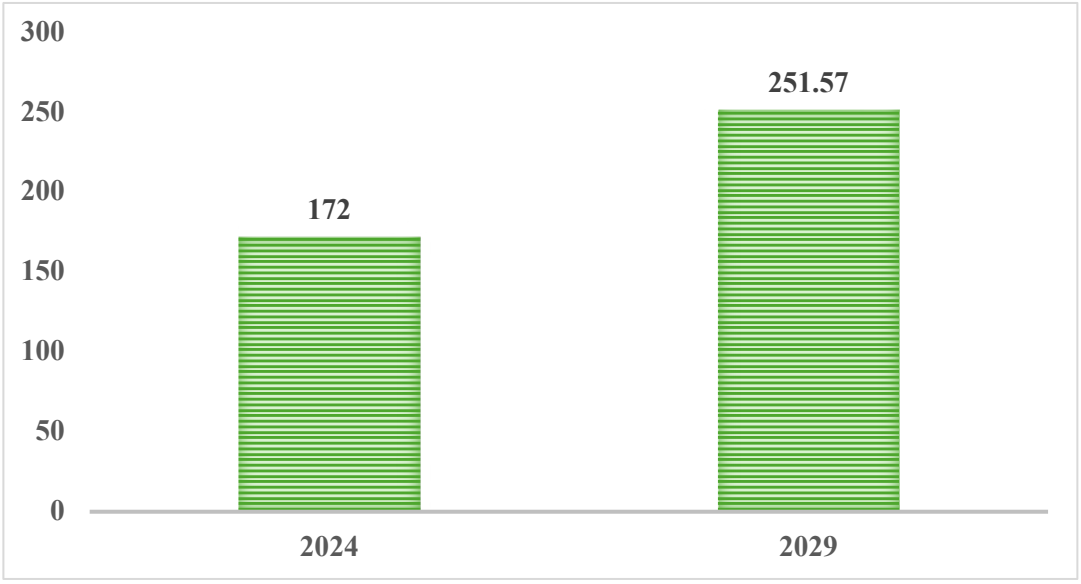
Source: Modor intelligence

Market Size of India Epoxy Resins Industry

The market size of India's epoxy resins 172 kilotonnes in 2024 and is expected to reach 251.57 kilotonnes by 2029 with a 7.90 per cent CAGR (see Chart 3).

Chart 3: Market size of India's Epoxy Resin Industry

(in kilotonnes)



Source: Modor intelligence

Industry Growth

The Indian epoxy resin market is experiencing substantial growth driven by its wide application across construction, woodworking, and manufacturing industries due to its strong adhesive properties, chemical and moisture resistance, and moderate temperature tolerance.

The market is segmented by raw materials, including DGBEA, DGBEF, Novolac, Aliphatic, and Glycidyl amine, and by applications, such as, paints and coatings, adhesives and sealants, composites, and electrical and electronics.

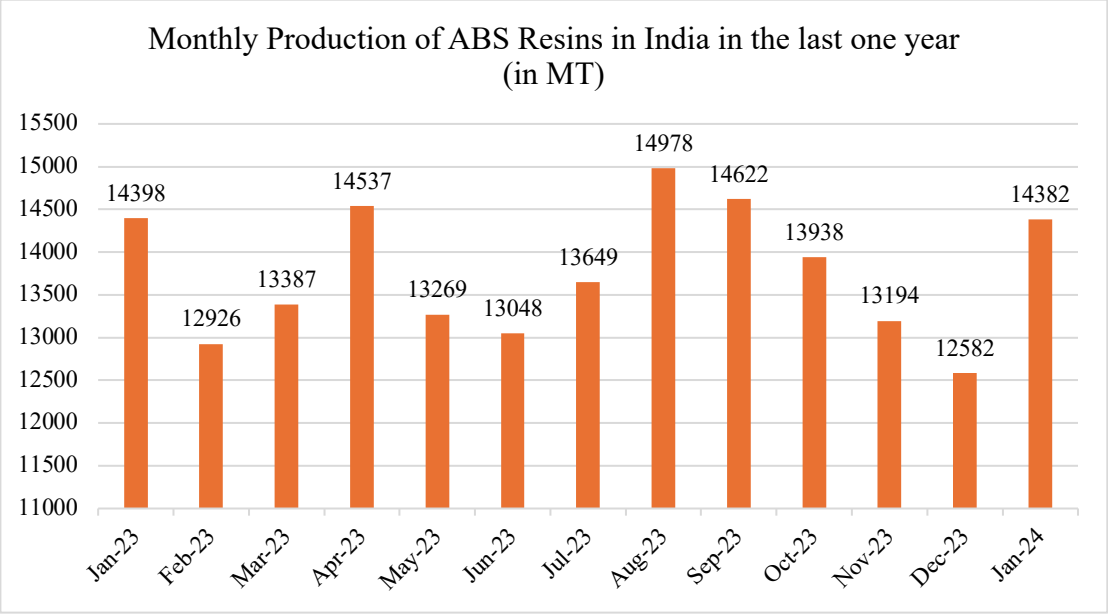
Paints and coatings dominate with a 37.7 per cent market share in 2023, while solid epoxy resin leads with 52.1 per cent, valued for its durability and versatility.

Production and Price Pattern of Resin in India

Monthly Production of ABS Resins in India (in MT)

The monthly production of ABS resins in India over the past year has been consistent with minor fluctuations (see Chart 4).

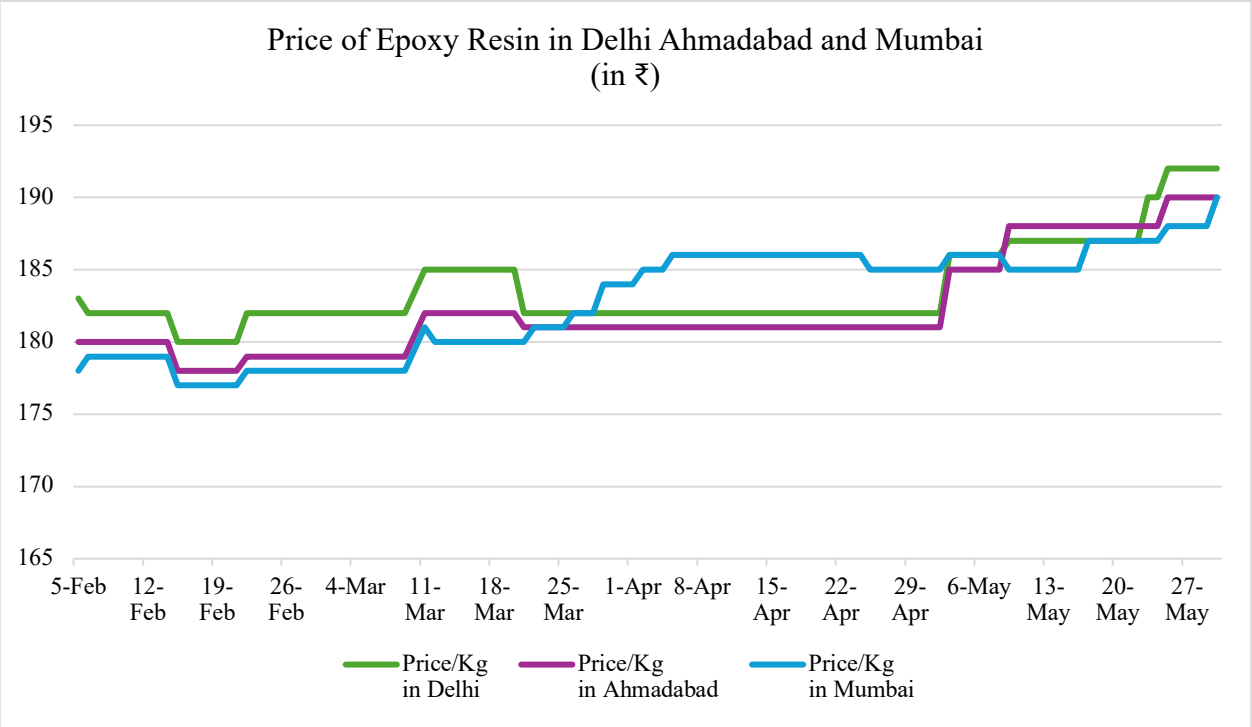
Chart 4: Production of ABS Resins in India



Source: CMIE Industry Outlook

The market for epoxy resins in India is concentrated in several key cities known for their industrial and manufacturing activities. Here are the prices of epoxy resin being traded in Delhi, Ahmadabad, and Mumbai (see Chart 5).

Chart 5: Daily Price of Epoxy Resin in Delhi, Ahmadabad, and Mumbai



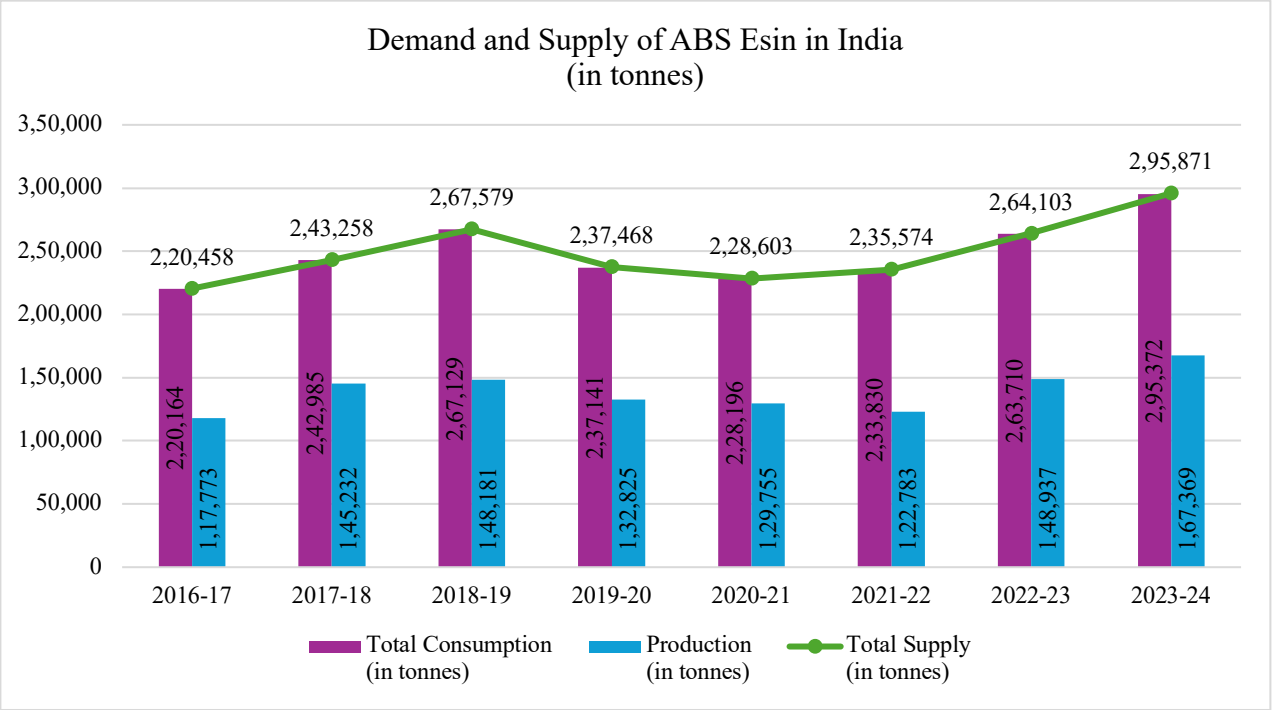
Source: Mordor Intelligence

Demand and Supply of ABS Resins

Acrylonitrile Butadiene Styrene (ABS) resin is another type of resin produced in India, which is widely used for a variety of applications due to its excellent mechanical properties, impact resistance, and ease of processing. The consumption of ABS resin in India consistently exceeded domestic production, necessitating imports to meet demand during the period 2016-17 to 2023.

On an average, domestic production covered only about 53.5 per cent to 59.8 per cent of the annual consumption, indicating a significant reliance on imports to bridge the gap. Despite gradual increases in production, the rising consumption trends highlight the persistent need for imports to fulfil the growing demand for ABS resins in the country (see Chart 6).

Chart 6: Demand and Supply of ABS Resin in India



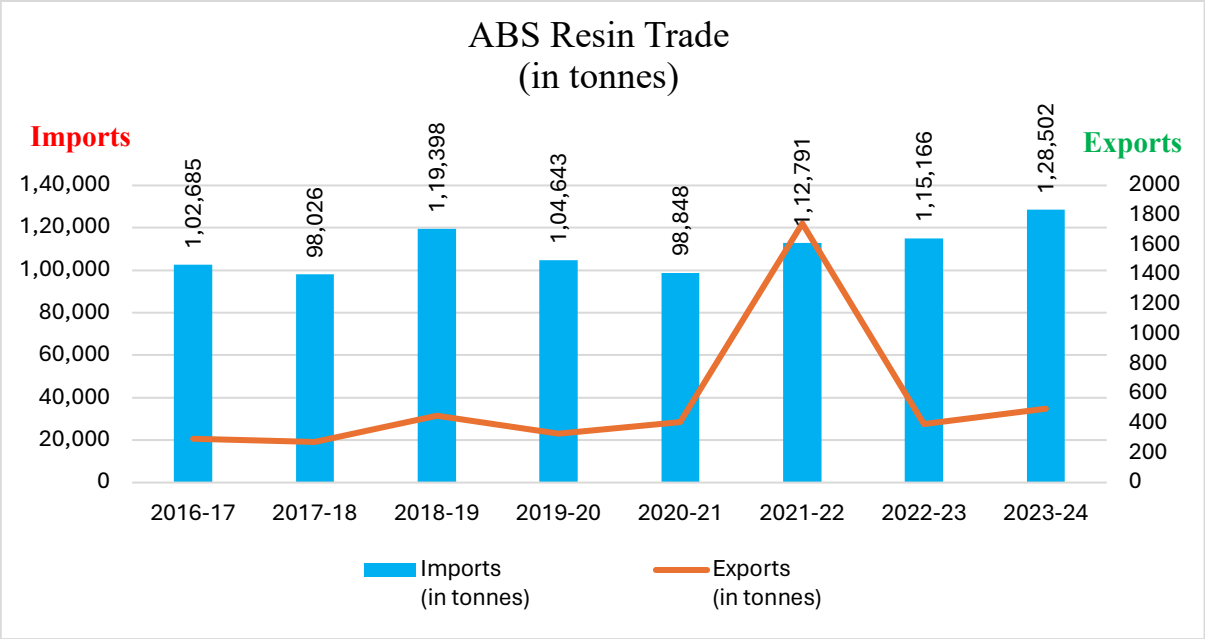
Source: CMIE Industry Outlook

Resin Trade

In the last two financial years, the polymer imports have increased moderately, and the increase is driven by the lower import realisation. During the FY23, the polymer imports grew by 39.7 per cent to 10.6 million tonnes. India was importing polymers from China, USA, UAE, and Saudi Arabia at cheaper rates. This led to lower import realisations, which declined by 7.8 per cent during FY23.

The sharpest decline was witnessed in import realisations of suspension grade PVC resins. Import realisations of suspension grade PVC resins declined by 22.7 per cent to ₹ 88.5 per kg in 2022-23. Suspension grade PVC resins are majorly imported from China, Japan, Taiwan, Korea, and USA (see Chart 7).

Chart 7: ABS Resin Trade Pattern in the last 8 years



Source: CMIE Industry Outlook

Government Initiatives

The Indian government's focus on "Atmanirbhar Bharat" (self-reliant India) promotes domestic production of chemicals, including resins. This can create a robust domestic chemical industry and reduce dependence on imports.

The impact of cheaper imports from China and the USA led domestic manufacturers to approach the Directorate General of Trade Remedies (DGTR) for a safeguard investigation into suspension grade PVC resins. The DGTR proposed imposing quantitative restrictions on imports from China, USA, Taiwan, and Russia for one year. The proposed caps were 92.2 thousand tonnes for China, 67.9 thousand tonnes for Taiwan, 43.5 thousand tonnes for the USA, and 40 thousand tonnes for Russia. The government has yet to implement these quantitative restrictions.

Epoxy Resin Market Ecosystem

- *Infrastructure Development*: Ambitious infrastructure projects in India, including highways, airports, and metro networks, drive substantial demand for epoxy resins due to their superior protection against corrosion, abrasion, and weathering, enhancing the longevity of these assets.
- *Technological Advancements*: Continuous R&D efforts lead to innovations in epoxy resin formulations, improving their performance, sustainability, and application

versatility, which in turn fuels market growth and adoption across diverse industries.

- *Increasing Industrial Applications*: Epoxy resins are widely used in industries such as automotive, electronics, aerospace, and marine due to their superior mechanical properties and chemical resistance. Applications range from automotive coatings to electronic encapsulation, contributing significantly to product durability and performance.
- *Growing Demand for Composites*: The shift towards lightweight materials and composites in the aerospace, automotive, and wind energy sectors boosts the demand for epoxy-based composites, which are essential as matrix materials in reinforcing fibres like carbon fibre and fiberglass.
- *Paints & Coatings*: This is the largest and second fastest-growing application for epoxy resins, driven by their excellent adhesion, durability, chemical resistance, and mechanical properties. Epoxy coatings provide protective barriers against corrosion, abrasion, chemicals, and weathering, extending the lifespan of metal substrates and enhancing the appearance and durability of consumer goods.
- *Building & Construction*: This sector captures the largest share of the epoxy resin market by end-use industry. Epoxy resin coatings enhance the durability, strength, and aesthetics of concrete surfaces and are used extensively as adhesives for structural bonding, anchoring, and repairs.
- *Regional Market*: Asia Pacific was the largest market for epoxy resin in 2022, with China being the largest consumer and producer. Rapid infrastructure development in China, India, and other Southeast Asian countries significantly impacts the epoxy resin industry, particularly in construction applications like coatings, adhesives, flooring, and composites.

Key Applications Driving Epoxy Resin Market Growth

- *Construction and Infrastructure*: Extensively used in flooring, structural reinforcement, and waterproofing applications. Epoxy-based composites enhance the durability and strength of bridges, buildings, and infrastructure components.
- *Electronics and Electricals*: Serve as encapsulants and potting compounds in electronic devices, providing insulation, protection, and thermal management. Increasing demand is driven by the proliferation of electronic gadgets and renewable energy systems.
- *Automotive and Transportation*: Improve the durability, corrosion resistance, and aesthetics of automotive components. In the transportation sector, epoxy composites contribute to lightweighting, fuel efficiency, and structural integrity.

Role of Technology

Technological advancements in epoxy resin formulations have led to the development of resins with enhanced properties, such as higher mechanical strength, improved chemical resistance, and better thermal stability. These advancements allow epoxy resins to meet the evolving requirements of industries, such as, aerospace, automotive, and electronics, provide strategies to incorporate more flexibility into the system and lead to cost advantages and new revenue streams of significant benefit to the industry.

The development of new curing technologies, including faster and more efficient curing agents, has improved the processing and productivity of epoxy resin-based products. Reduced curing times and improved curing characteristics have expanded the possibility of application of epoxy resins in time-sensitive industries and integrating automation within the resins and consumer goods sectors. Raising the bar requires upskilling the talent not just across platforms and tools, but also across contexts.

Challenges Facing the Resin Industry in India

Volatility in Raw Material Prices: Fluctuations in the prices of key precursors like bisphenol-A (BPA) and epichlorohydrin (ECH) can impact profitability and lead to market price instability.

Environmental Concerns: The production and disposal of epoxy resins pose ecological challenges, necessitating investment in sustainable and eco-friendly alternatives. Hence issues of waste management, reduced fossil fuel consumption, and less greenhouse gas emissions (GHGs) must acquire a sharper focus.

Regulatory Constraints: Stringent environmental regulations regarding VOC emissions and hazardous waste disposal require compliance and investment in pollution control measures.

Competition from Alternative Materials: Epoxy resins face competition from alternatives like polyurethane, polyester, vinyl ester, and phenolic resins, which may offer advantages, such as, better flexibility, lower cost, or higher temperature resistance, impacting demand.[4]

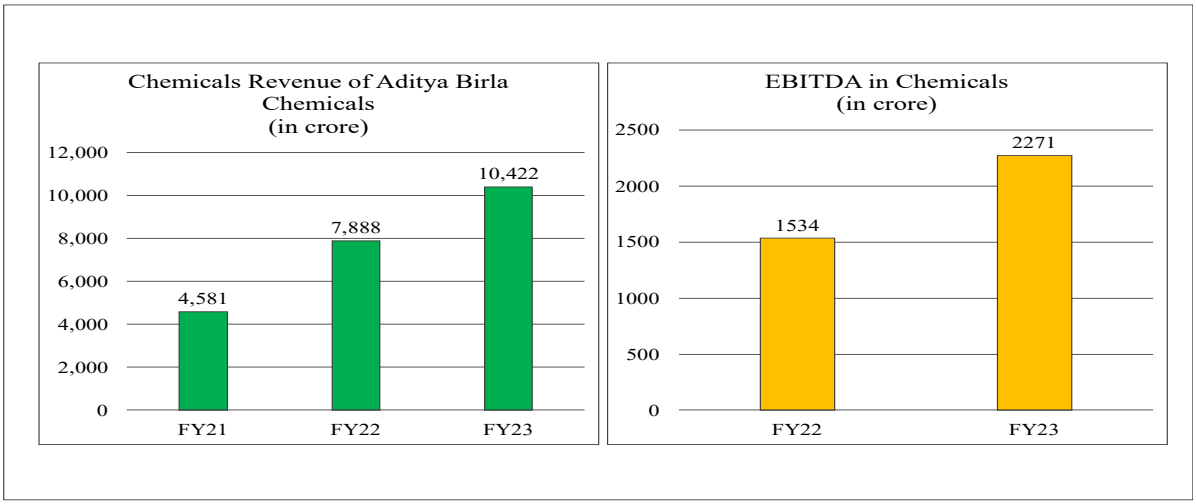
In view of the winds of change sweeping the country, there is a manifest need to devise solutions to evolving needs, performance metrics and industry challenges for greener operations without affecting the bottom line. This is a tall order and requires, *inter-alia*, an open mind and building a culture of innovation, digital strategy, an accent on transformation and sharing experiences and successes.

Key Companies in the Resin Industry

Aditya Birla Chemicals:

- Operates epoxy resin plants in Germany, Thailand, and India.[5]
- Achieved record revenue and EBITDA in FY23, with a 32 per cent revenue growth year-on-year.[6]

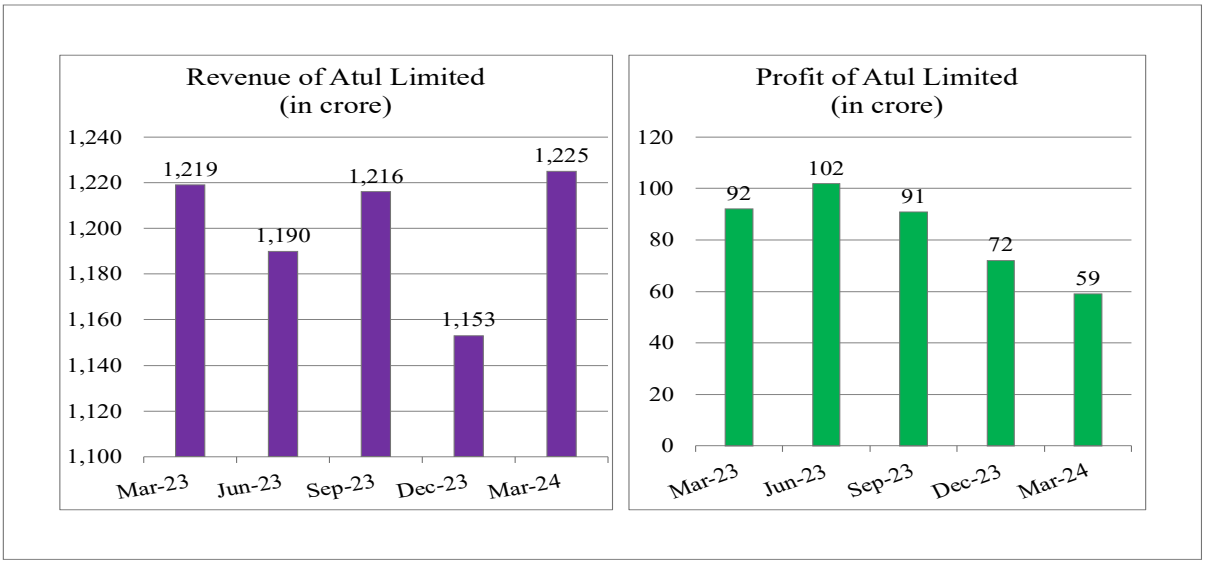
Key Financials of Aditya Birla Chemicals



Atul Limited:

One of the largest integrated chemical companies in India, with significant contributions from epoxy resins.[7]

Key Financials of Atul Limited



Road Ahead

The future of India's resin industry looks promising, driven by its robust chemical sector and significant contributions to various industrial applications. The industry's growth is expected to be driven by advancements in technology, increased demand in key sectors, such as, construction, automotive, and electronics, and supportive government policies promoting domestic production and reducing dependency on imports. These technologies need to be leveraged to mitigate operational disruptions, reduce labour shortages, and streamline production processes effectively.

An effective change management strategy requires measuring operational efficiency, employee engagement, navigational progress, customer feedback and initiative outcomes. Initiatives like "Atmanirbhar Bharat" aim to enhance self-reliance, further bolstering the industry's capacity and global competitiveness.

To maintain this growth trajectory, addressing challenges, such as, volatility in raw material prices, environmental concerns, and regulatory constraints will be crucial. Investment in sustainable practices and eco-friendly alternatives will be essential for long-term viability. Also, leveraging technological advancements, such as, digitalization and artificial intelligence to improve resin formulations and production processes can enhance the industry's resilience and adaptability.

With strategic planning, innovation, and implementation of next-generation technologies and solutions, the Indian resin industry is poised to achieve significant milestones, contributing substantially to the country’s economic growth and industrial development.

References

[1] https://chemicals.gov.in/sites/default/files/inline-files/Report_Understanding_Industry_Landscape.pdf
[2] Market.us, https://market.us/report/epoxy-resin-market/
[3] Mordor Intelligence, https://www.mordorintelligence.com/industry-reports/global-epoxy-resin-market-industry
[4] https://www.consegicbusinessintelligence.com/request-sample/1339
[5] https://www.grasim.com/Upload/PDF/grasim-annual-report-2022-23.pdf
[6] https://aether.co.in/wp-content/uploads/2022/05/22.-Industry-Report.pdf
[7] https://www.atul.co.in/businesses