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Polyamide-imide Resin Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Unfilled, Glass Filled, Carbon Filled and Others), By End-Use Industry (Automotive, Aerospace, Electrical & Electronics, Oil & Gas, and Others), By Region & Competition, 2021-2031F

https://marketpublishers.com/r/PBB4666778D2EN.html
Date: January 2026
Pages: 185
Price: US$ 4,500.00 (Single User License)
ID: PBB4666778D2EN

Abstracts

The Global Polyamide-imide Resin market is projected to expand from USD 0.76 Billion in 2025 to USD 1.15 Billion by 2031, achieving a compound annual growth rate of 7.15%. Polyamide-imide (PAI) resin is a high-performance polymer known for its superior thermal stability, chemical resistance, and mechanical durability, characteristics that make it indispensable for manufacturing wire enamels and precision molded components. Growth is largely fueled by the automotive and aerospace industries, where the shift toward electrification requires materials that can endure extreme temperatures and mechanical stress. Data from the European Automobile Manufacturers? Association (ACEA) highlights this trend, reporting that hybrid-electric vehicle registrations in the European Union rose by 19.6% in 2024 compared to the prior year, underscoring the rising need for PAI in advanced electrical insulation applications.

Despite this growth potential, market development is hindered by high production costs stemming from the intricate synthesis and processing required for these resins. Manufacturers are burdened by rising energy prices and underutilized production facilities, which reduce profitability and postpone necessary capacity expansions. This structural inefficiency is reflected in data from the German Chemical Industry Association (VCI), which noted that capacity utilization in the chemical sector averaged just 75 percent in 2024, a rate too low for profitable operations. These economic

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pressures present a significant obstacle to the broader expansion of the engineering plastics industry.

Market Driver

The surging Electric Vehicle (EV) sector acts as the primary growth engine for the Global Polyamide-imide Resin market, fueling demand for premium wire enamels and electrical insulation. As automakers shift toward high-voltage architectures, such as 800V systems, there is an urgent requirement for insulating materials like PAI that maintain dielectric strength and mechanical stability under high heat. This electrification trend drives the consumption of PAI-based magnet wire coatings used in traction motors. According to the International Energy Agency?s 'Global EV Outlook 2024', released in April 2024, global electric car sales were forecast to hit 17 million units for the year, establishing a massive demand for thermal management polymers in powertrain applications.

Concurrently, the market is bolstered by the aerospace sector's demand for high-performance materials, where PAI is increasingly used to replace metal in non-structural parts to reduce weight while maintaining thermal resilience. This substitution is essential for enhancing fuel efficiency and lowering emissions in modern aircraft. The sector's robust activity is evident in manufacturing figures; Airbus reported in January 2025 that it delivered 766 commercial aircraft in 2024, signaling strong industrial demand. Furthermore, long-term stability is assured by a massive backlog of orders; the International Air Transport Association (IATA) reported in December 2024 that unfulfilled global aircraft orders reached a record 17,000 units, guaranteeing sustained consumption of polyamide-imide resins.

Market Challenge

The Global Polyamide-imide Resin market faces a major hurdle in the form of prohibitive production costs, driven by complex synthesis processes and high energy expenditures. Manufacturing these advanced polymers requires energy-intensive operations, making producers highly sensitive to utility rate fluctuations. As companies absorb these rising costs, profit margins shrink, severely restricting the funds available for facility upgrades or capacity growth. This financial strain fosters a risk-averse atmosphere where infrastructure investments are postponed, thereby limiting the industry's capacity to scale supply in response to growing demand from the automotive and aerospace sectors.

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This stagnation in operations is reflected in recent chemical manufacturing data. The American Chemistry Council (ACC) reported that chemical output volumes in the United States declined by 0.4 percent in 2024 relative to the previous year. This downturn illustrates the challenges manufacturers face in maintaining growth while contending with elevated input costs. Consequently, the inability to increase production volumes results in a supply-demand imbalance, which directly impedes the wider adoption and market growth of polyamide-imide resins in cost-conscious industrial applications.

Market Trends

Increasingly strict environmental regulations are pushing chemical suppliers to develop NMP-free and water-dilutable polyamide-imide formulations. This shift addresses toxicity concerns associated with N-Methyl-2-pyrrolidone, a solvent historically used in resin synthesis. By removing this hazardous substance, manufacturers seek to ensure regulatory compliance while preserving the material's thermal endurance. This pressure is accelerating as agencies act to limit chemical risks; in June 2024, the U.S. Environmental Protection Agency (EPA) proposed a rule under the Toxic Substances Control Act to ban the commercial use and manufacture of NMP in various sectors to protect worker health.

In parallel, the telecommunications industry is incorporating PAI resins into 5G infrastructure to facilitate high-frequency data transmission. The material is becoming a preferred choice for semiconductor test sockets and antenna housings, thanks to its low dielectric constant which minimizes signal loss and ensures dimensional stability. This application segment is growing rapidly as network providers upgrade their grids. As noted in the 'Ericsson Mobility Report' from June 2024, global 5G subscriptions jumped by 160 million in the first quarter of 2024 alone, driving a strong market for advanced engineering plastics capable of operating effectively in next-generation network hardware.

Key Market Players

Solvay SA

Toyobo Co. Ltd.

Elantas

Mitsubishi Shoji

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Axalta Coating Systems, LLC

Shanghai Songhan Plastics Technology Co., Ltd

Fujifilm Holdings Corporation

Ensinger GmbH

Innotek Technology

Kermel S.A.

Report Scope

In this report, the Global Polyamide-imide Resin market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Polyamide-imide Resin market, By Type

Unfilled

Glass Filled

Carbon Filled and Others

Polyamide-imide Resin market, By End-Use Industry

Automotive

Aerospace

Electrical & Electronics

Oil & Gas

and Others

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Polyamide-imide Resin market, By Region

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - France
  - United Kingdom
  - Italy
  - Germany
  - Spain
- Asia Pacific
  - China
  - India
  - Japan
  - Australia
  - South Korea
- South America
  - Brazil

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Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Polyamide-imide Resin market.

Available Customizations:

Global Polyamide-imide Resin 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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Contents

1. PRODUCT OVERVIEW

1.1. Market Definition
1.2. Scope of the Market
  1.2.1. Markets Covered
  1.2.2. Years Considered for Study
  1.2.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

2.1. Objective of the Study
2.2. Baseline Methodology
2.3. Key Industry Partners
2.4. Major Association and Secondary Sources
2.5. Forecasting Methodology
2.6. Data Triangulation & Validation
2.7. Assumptions and Limitations

3. EXECUTIVE SUMMARY

3.1. Overview of the Market
3.2. Overview of Key Market Segmentations
3.3. Overview of Key Market Players
3.4. Overview of Key Regions/Countries
3.5. Overview of Market Drivers, Challenges, Trends

4. VOICE OF CUSTOMER

5. GLOBAL POLYAMIDE-IMIDE RESIN MARKET OUTLOOK

5.1. Market Size & Forecast
  5.1.1. By Value
5.2. Market Share & Forecast
  5.2.1. By Type (Unfilled, Glass Filled, Carbon Filled and Others)
  5.2.2. By End-Use Industry (Automotive, Aerospace, Electrical & Electronics, Oil & Gas, and Others)
  5.2.3. By Region

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5.2.4. By Company (2025)
5.3. Market Map

6. NORTH AMERICA POLYAMIDE-IMIDE RESIN MARKET OUTLOOK

6.1. Market Size & Forecast
6.1.1. By Value
6.2. Market Share & Forecast
6.2.1. By Type
6.2.2. By End-Use Industry
6.2.3. By Country
6.3. North America: Country Analysis
6.3.1. United States Polyamide-imide Resin market Outlook
6.3.1.1. Market Size & Forecast
6.3.1.1.1. By Value
6.3.1.2. Market Share & Forecast
6.3.1.2.1. By Type
6.3.1.2.2. By End-Use Industry
6.3.2. Canada Polyamide-imide Resin market Outlook
6.3.2.1. Market Size & Forecast
6.3.2.1.1. By Value
6.3.2.2. Market Share & Forecast
6.3.2.2.1. By Type
6.3.2.2.2. By End-Use Industry
6.3.3. Mexico Polyamide-imide Resin market Outlook
6.3.3.1. Market Size & Forecast
6.3.3.1.1. By Value
6.3.3.2. Market Share & Forecast
6.3.3.2.1. By Type
6.3.3.2.2. By End-Use Industry

7. EUROPE POLYAMIDE-IMIDE RESIN MARKET OUTLOOK

7.1. Market Size & Forecast
7.1.1. By Value
7.2. Market Share & Forecast
7.2.1. By Type
7.2.2. By End-Use Industry
7.2.3. By Country

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7.3. Europe: Country Analysis
7.3.1. Germany Polyamide-imide Resin market Outlook
7.3.1.1. Market Size & Forecast
7.3.1.1.1. By Value
7.3.1.2. Market Share & Forecast
7.3.1.2.1. By Type
7.3.1.2.2. By End-Use Industry
7.3.2. France Polyamide-imide Resin market Outlook
7.3.2.1. Market Size & Forecast
7.3.2.1.1. By Value
7.3.2.2. Market Share & Forecast
7.3.2.2.1. By Type
7.3.2.2.2. By End-Use Industry
7.3.3. United Kingdom Polyamide-imide Resin market Outlook
7.3.3.1. Market Size & Forecast
7.3.3.1.1. By Value
7.3.3.2. Market Share & Forecast
7.3.3.2.1. By Type
7.3.3.2.2. By End-Use Industry
7.3.4. Italy Polyamide-imide Resin market Outlook
7.3.4.1. Market Size & Forecast
7.3.4.1.1. By Value
7.3.4.2. Market Share & Forecast
7.3.4.2.1. By Type
7.3.4.2.2. By End-Use Industry
7.3.5. Spain Polyamide-imide Resin market Outlook
7.3.5.1. Market Size & Forecast
7.3.5.1.1. By Value
7.3.5.2. Market Share & Forecast
7.3.5.2.1. By Type
7.3.5.2.2. By End-Use Industry

8. ASIA PACIFIC POLYAMIDE-IMIDE RESIN MARKET OUTLOOK

8.1. Market Size & Forecast
8.1.1. By Value
8.2. Market Share & Forecast
8.2.1. By Type
8.2.2. By End-Use Industry

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8.2.3. By Country
8.3. Asia Pacific: Country Analysis
8.3.1. China Polyamide-imide Resin market Outlook
8.3.1.1. Market Size & Forecast
8.3.1.1.1. By Value
8.3.1.2. Market Share & Forecast
8.3.1.2.1. By Type
8.3.1.2.2. By End-Use Industry
8.3.2. India Polyamide-imide Resin market Outlook
8.3.2.1. Market Size & Forecast
8.3.2.1.1. By Value
8.3.2.2. Market Share & Forecast
8.3.2.2.1. By Type
8.3.2.2.2. By End-Use Industry
8.3.3. Japan Polyamide-imide Resin market Outlook
8.3.3.1. Market Size & Forecast
8.3.3.1.1. By Value
8.3.3.2. Market Share & Forecast
8.3.3.2.1. By Type
8.3.3.2.2. By End-Use Industry
8.3.4. South Korea Polyamide-imide Resin market Outlook
8.3.4.1. Market Size & Forecast
8.3.4.1.1. By Value
8.3.4.2. Market Share & Forecast
8.3.4.2.1. By Type
8.3.4.2.2. By End-Use Industry
8.3.5. Australia Polyamide-imide Resin market Outlook
8.3.5.1. Market Size & Forecast
8.3.5.1.1. By Value
8.3.5.2. Market Share & Forecast
8.3.5.2.1. By Type
8.3.5.2.2. By End-Use Industry

9. MIDDLE EAST & AFRICA POLYAMIDE-IMIDE RESIN MARKET OUTLOOK

9.1. Market Size & Forecast
9.1.1. By Value
9.2. Market Share & Forecast
9.2.1. By Type

+357 96 030922
info@marketpublishers.com

9.2.2. By End-Use Industry
9.2.3. By Country
9.3. Middle East & Africa: Country Analysis
9.3.1. Saudi Arabia Polyamide-imide Resin market Outlook
9.3.1.1. Market Size & Forecast
9.3.1.1.1. By Value
9.3.1.2. Market Share & Forecast
9.3.1.2.1. By Type
9.3.1.2.2. By End-Use Industry
9.3.2. UAE Polyamide-imide Resin market Outlook
9.3.2.1. Market Size & Forecast
9.3.2.1.1. By Value
9.3.2.2. Market Share & Forecast
9.3.2.2.1. By Type
9.3.2.2.2. By End-Use Industry
9.3.3. South Africa Polyamide-imide Resin market Outlook
9.3.3.1. Market Size & Forecast
9.3.3.1.1. By Value
9.3.3.2. Market Share & Forecast
9.3.3.2.1. By Type
9.3.3.2.2. By End-Use Industry

10. SOUTH AMERICA POLYAMIDE-IMIDE RESIN MARKET OUTLOOK

10.1. Market Size & Forecast
10.1.1. By Value
10.2. Market Share & Forecast
10.2.1. By Type
10.2.2. By End-Use Industry
10.2.3. By Country
10.3. South America: Country Analysis
10.3.1. Brazil Polyamide-imide Resin market Outlook
10.3.1.1. Market Size & Forecast
10.3.1.1.1. By Value
10.3.1.2. Market Share & Forecast
10.3.1.2.1. By Type
10.3.1.2.2. By End-Use Industry
10.3.2. Colombia Polyamide-imide Resin market Outlook
10.3.2.1. Market Size & Forecast

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10.3.2.1.1. By Value
10.3.2.2. Market Share & Forecast
10.3.2.2.1. By Type
10.3.2.2.2. By End-Use Industry
10.3.3. Argentina Polyamide-imide Resin market Outlook
10.3.3.1. Market Size & Forecast
10.3.3.1.1. By Value
10.3.3.2. Market Share & Forecast
10.3.3.2.1. By Type
10.3.3.2.2. By End-Use Industry

11. MARKET DYNAMICS

11.1. Drivers
11.2. Challenges

12. MARKET TRENDS & DEVELOPMENTS

12.1. Merger & Acquisition (If Any)
12.2. Product Launches (If Any)
12.3. Recent Developments

13. GLOBAL POLYAMIDE-IMIDE RESIN MARKET: SWOT ANALYSIS

14. PORTER'S FIVE FORCES ANALYSIS

14.1. Competition in the Industry
14.2. Potential of New Entrants
14.3. Power of Suppliers
14.4. Power of Customers
14.5. Threat of Substitute Products

15. COMPETITIVE LANDSCAPE

15.1. Solvay SA
15.1.1. Business Overview
15.1.2. Products & Services
15.1.3. Recent Developments
15.1.4. Key Personnel

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15.1.5. SWOT Analysis
15.2. Toyobo Co. Ltd.
15.3. Elantas
15.4. Mitsubishi Shoji
15.5. Axalta Coating Systems, LLC
15.6. Shanghai Songhan Plastics Technology Co., Ltd
15.7. Fujifilm Holdings Corporation
15.8. Ensinger GmbH
15.9. Innotek Technology
15.10. Kermel S.A.

16. STRATEGIC RECOMMENDATIONS

17. ABOUT US & DISCLAIMER

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