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**GLOBAL EPOXY**

**RESIN MARKET**

**FORECAST & OPPORTUNITIES, 2030**

**PUBLISHED: September 2021**

**MARKET INTELLIGENCE. CONSULTING**

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**Executive Summary**

**Overview of the Company:**

* Reliance Industries Limited is Indian based, one of well-known brands involved in manufacturing and sales of diverse range of products including polymers, aromatics, elastomers etc. globally.
* The company cater customers and various industries viz., healthcare, automotive, packaging etc across over 70 countries worldwide.
* The company’s total production capacity of PE, PP and PVC is 2.3, 2.9 and 0.7 million MT per annum as of 2019.
* The company exported 1.1 million MT of polymers globally in 2019.
* The company has 6 state-of-the-art manufacturing facilities for polymers production.

**1.2 Brief Profile of Board of Directors:**

**Mukesh Ambani:** Mr. Mukesh D. Ambani (DIN 00001695) is a Chemical Engineer from the Institute of Chemical Technology, Mumbai (erstwhile the University Department of Chemical Technology, University of Mumbai). He pursued an MBA from Stanford University in the US. He has been on the Board of Reliance since 1977.

**Nita M. Ambani:** Mrs. Nita M. Ambani (DIN 03115198) is a Commerce Graduate from Mumbai University and a diploma holder in Early Childhood Education.

**Hital R. Meswani:** Mr. Hital R. Meswani (DIN 00001623) is a Management & Technology graduate from the University of Pennsylvania (UPenn) in the USA.

**Nikhil R. Meswani:** Nikhil Meswani is an Executive Director on the Board of Reliance. A chemical engineer from the University Institute of Chemical Technology (UICT) Mumbai, he joined Reliance in 1986.

**P.M.S. Prasad:** PMS Prasad is an Executive Director at Reliance and one of the longest serving members on the Board and the company.

**P.K. Kapil:** PK Kapil is an Executive Director on the Board of Reliance. With experience spanning four decades, he is a driving force in the HSE, Technology, Reliability and Operations of all manufacturing sites.

**R.A. Mashelkar:** RA Mashelkar is an independent Director on the Board of Reliance. An eminent scientist and champion of the Innovation Movement in India, he is the Chairman of Reliance Innovation Council.

**Adil Zainulbhai:** Adil Zainulbhai is an independent Director on the Board of Reliance. One of the world’s foremost consultants, he is a mechanical engineering graduate from IIT and holds an MBA from Harvard.

**Mansingh L. Bhakta:** Mansingh Bhakta is an independent Director on the Board of Reliance. An advocate par excellence, he has almost six decades of experience.

**Dipak C. Jain:** Dipak Jain is an independent Director on the Board of Reliance. One of the world’s top educationalists, he is a former Dean of Kellogg School of Management and INSEAD.

**Dharam Vir Kapur:** Dharam Vir Kapur is an independent Director on the Board of Reliance. A technology, industrial development and project implementation expert, he has a long and illustrious career in the Indian government.

**Mahesh P. Modi:** Mahesh Modi is an independent Director on the Board of Reliance. He has in-depth management experience in the petrochemical, telecommunications, energy and insurance industries.

**Yogendra P. Trivedi:** Yogendra Trivedi is an independent Director on the Board of Reliance. He is an expert in the fields of economics, politics, education, sports, and social and professional services.

**Ashok Misra:** Ashok Misra is an independent Director on the Board of Reliance. An IIT Director from 2000-2008, Misra was the driving force behind its transformation into a leading research and development institute.

* 1. **Brief Project summary & Key Highlights of The Project**

India has emerged as a leading economy in world and has an average growth rate of around 7% in last decade. The manufacturing sector plays a crucial role in Indian Economy and chemical manufacturing amongst it is a crucial sector which spread it roots across wide range of end use industries. According to index of Industrial production (IIP) the chemical industry already returning to pre-Covid level, the industry is expected to grow at a CAGR of about 9.2% by 2025.

In terms of Manufacturing Competency, India is the fifth largest producer of cars and textiles. Also, as per Consumer Electronics and Appliance Manufacturers Association (CEAMA) electronic production constitute around 3% of Global Electronic production.

Epoxy resin is a reactive polymer or prepolymer containing epoxide group. Epoxy resin is a resin produced by esterification of epoxy resin with acrylic or methacrylic acids. This compound possesses various properties such as corrosion resistance, high thermal stability, high mechanical strength, high chemical and environmental resistance, durability, adhesion etc. owing to these properties, epoxy resins find application in several areas including paints and coatings, adhesives, composites, electronic encapsulation, and others.

Major end use industries for epoxy resins include building and construction, automotive, general industrial, consumer goods, wind power, aerospace, marine, etc.

**Factors Driving the growth of Epoxy Resin and Epoxy Resin.**

* To make India a global hub for Electronic Manufacturing with Government incentive schemes like Modified Incentive Special Scheme (M-SIPS) and Electronic Development Fund (EDF).
* Global shifts in trade policies owning to US-China trade war and Global shift in sentiments due to Covid-19 pandemic and looking for another Manufacturing Hub in Asia Pacific.
* National Infrastructure Pipeline (NIP) unveiled by central government has an investment budget of 1.4 USD trillion targeting 24% on renewable energy, 19% on road & highway, 16% on urban infrastructure and 13% on railway.
* Under the smart city mission, total of 5,956 housing projects is to be completed by 2025.

**Product Profile**

Epoxy resins have a set of unique combinations of properties and performance characteristics. They are used in the manufacturing of a vast variety of components and end products where their presence may not always obvious but is vital for the functioning or service life enhancement of the end product.

The socio-economic value of downstream industries (e.g., building & construction, transportation, general industrial, consumer goods, wind power, aerospace, marine, electrical & electronics and others) depends on the enabling characteristics of epoxy resins, which exceeds the epoxy industry values many times over.

One of the major sectors for Epoxy resins is manufacturing wind turbine blades as structural elements (fiber composites), as coatings of generators and other components and as adhesives. This provides the blades with added strength and high durability at a lightweight, enables longer blades. Protective coatings enhance the operational lifetime of both the components and turbines at a low cost. These characteristics ensure more energy generation at a lower unit cost.

Industrially, epoxy resin is used by manufacturer of electrical and energy distribution systems as sealants, coatings and adhesives, as well as by manufacturer of primary components such as insulators, transformers and bushings. In the water pipe/infrastructure sector, epoxies prevent corrosion and leaks and extend the operational lifetime of underground pipes, seashore pipes etc. Epoxy resins are used in cars, trucks, motorcycles, trains, boats and aircraft for coating purpose. In internal parts, advantages include weight reduction (leading to lower emissions), enhanced durability, mechanical strength, and heat resistance

Medical sector use epoxy resins in surgical instruments, diagnostic equipment, and prosthetics

Bisphenol-A, Epoxy resin is the major type of Epoxy resin, accounting for around 80-85% share, which possess resistance to various organic and inorganic acids, alkalis, salt solutions and oxidizing chemicals, etc. Novolac epoxy resin segment provides high-temperature performance, corrosion, and chemical resistance, pultrusion and carbon

fiber & is projected to exhibit the highest CAGR of the demand. Brominated Epoxy resin. The common characteristic of this Brominated epoxy resin is that it has good self-quenching and heat resistance

The key players operating in the global epoxy resin market are Olin Corporation, Tohto Kasei, BASF SE, Atul Ltd., Dow Chemical Company, Hexion Inc., Huntsman Corporation, Kukdo Chemicals Co. Ltd., Nan Ya Plastics Corporation, Olin Corporation, Solvay SA, and Techstorm Advanced Materials.

Due to the onset of COxVID-19, disruption in the business cycle has impacted the supply chain of both finished product demand and raw material availability. The virus outbreak has affected the transportation sector worldwide. Advisories restricting travel related concerns over the Coronavirus pandemic that may lead to delays in the commercial decision making in the short term, but the long-term impact remains unknown as the longevity of the crisis is uncertain.

All major companies operating in the market are expected to witness a decline in revenues for the 2nd and 3rd quarters of 2020.

Moreover, due to COVID-19, a slowdown in the automotive & construction sector has been witnessed. Furthermore, the emergence of fresh COVID-19 cases in the US, India, China and Southeast Asian countries has impacted the supply chain in any related industries. Consequently, a degrowth in demand from Polycarbonate industry has been witnessed which further resulted in lower demand for Epoxy Resin.

The construction industry was severely impacted in 2020 and is likely to witness a significant decline in revenues due to lockdown conditions. Further, there resulted in lower demand for related industries such as Paint & Coating and Resin industry which had created a temporary slump in demand of Epoxy Resin. Currently, the conditions are getting better, which has concreted the probability of market recovery over the forecast period.

Asia-Pacific and Europe regions account for the largest share in the global epoxy resin market, owing to presence of major infrastructure development projects and chemical industry in these two regions. Epoxy resin & its grade exhibit high-performance, high-tech material that enables industries to produce outstanding products at lower and thus remain competitive also in critical times. This way Consumers get benefit from high quality and durable products that enable today’s lifestyle at a reasonable cost.

**India Demand Supply Scenario 2015 – 2030F**

**India Epoxy Resin Capacity, Production and Demand, By Volume, 2015 - 2030F (Thousand Tonnes)**

*Source: TechSci Research*

**Per Capita consumption of paints & coatings in major economies across the globe, 2020**

**India GDP growth trend projection FY2021 – FY2022**

**3.2.2.1. Demand By Application**

**Figure 27: India Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

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*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 26 | 29 | 32 | 35 | 39 | 46 | 40 | 43 | 48 | 52 | 57 | 62 | 67 | 73 | 78 | 85 |
| Electrical & Electronics | 15 | 17 | 18 | 20 | 23 | 26 | 23 | 25 | 28 | 30 | 33 | 36 | 39 | 42 | 46 | 50 |
| Construction | 7 | 7 | 8 | 9 | 10 | 12 | 10 | 11 | 12 | 14 | 15 | 16 | 18 | 19 | 21 | 22 |
| Composite Materials | 5 | 5 | 6 | 7 | 8 | 9 | 8 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 17 |
| Adhesives | 4 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | 7 | 8 | 8 | 9 | 10 | 11 | 12 | 13 |
| Others | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 |
| **Total** | **59** | **65** | **72** | **80** | **89** | **103** | **89** | **98** | **108** | **118** | **129** | **140** | **152** | **165** | **178** | **193** |

**3.2.2.2. Demand By Grade**

**Figure 28: India Epoxy Resin Demand, By Grade, By Volume, 2015–2030F**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 27 | 30 | 33 | 36 | 41 | 47 | 41 | 45 | 50 | 54 | 59 | 65 | 71 | 77 | 83 | 90 |
| Semi-Solid | 4 | 4 | 5 | 5 | 6 | 7 | 6 | 6 | 7 | 7 | 8 | 9 | 9 | 10 | 11 | 12 |
| Solid | 28 | 31 | 34 | 38 | 43 | 49 | 42 | 47 | 51 | 56 | 61 | 66 | 72 | 78 | 84 | 91 |
| Total | **59** | **65** | **72** | **80** | **89** | **103** | **89** | **98** | **108** | **118** | **129** | **140** | **152** | **165** | **178** | **193** |

*Source: TechSci Research*

**3.2.2.3. Demand By Type**

**Figure 29: India Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Type** | **2015** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Bisphenol A Based Resin | 52 | 57 | 63 | 69 | 78 | 89 | 77 | 85 | 92 | 101 | 110 | 119 | 129 | 140 | 150 | 162 |
| Bisphenol F Based Resin | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | 7 |
| Epoxy Phenol Novolac Based Resin | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 6 |
| Cycloaliphatic Epoxy Based Resin | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 |
| Others | 4 | 5 | 5 | 6 | 7 | 7 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total** | 59 | 65 | 72 | 80 | 89 | 103 | 89 | 98 | 108 | 118 | 129 | 140 | 152 | 165 | 178 | 193 |

**Global Epoxy Resin Demand Supply Scenario**

**Chapter 3. Market Outlook and Relevance of the Project**

**3.1. Demand Supply Outlook – Global Epoxy Resin Market**

**Table 1: Global Epoxy Resin Demand-Supply Scenario, 2015-2030F (Thousand Tonnes)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameters** | **2015** | **2020** | **2021E** | **2025F** | **2030F** |
| **Total Installed Capacity** | 3766 | 4484 | 4519 | 4648 | 4648 |
| **Total Production** | 2866 | 3246 | 3485 | 3724 | 4119 |
| **Total Demand/ Consumption** | 2754 | 3261 | 3494 | 4400 | 5511 |
| **Total Demand (Y-O-Y Growth Rate, %)** | 0.00% | -3.08% | 7.14% | 5.45% | 4.37% |
| **Demand – Supply Gap** | 0 | 0 | -9 | -676 | -1392 |

*Source: TechSci Research*

**3.1.1Global Demand by Volume**

**Figure 2: Global Epoxy Resin Market Size, By Volume (Thousand Tonnes), 2015–2030F**

*Source: TechSci Research*

**2021-2030**

**CAGR**

**5.19% By Volume**

**2015-2020**

**CAGR**

**3.44% By Volume**

**3.1.1. Capacity By Company**

**Table 2: Global Epoxy Resin Capacity, By Company (Thousand Tonnes), 2015-2030F (Continued)**



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Company** | **Location** | **Capacity** | | | | |
| **2015** | **2020** | **2021E** | **2025F** | **2030F** |
| Olin Corporation | USA | 170 | 170 | 170 | 170 | 170 |
| Germany | 170 | 245 | 245 | 245 | 245 |
| Brazil | 33 | 33 | 33 | 33 | 33 |
| Italy | 20 | 20 | 20 | 20 | 20 |
| China | 41 | 41 | 41 | 41 | 41 |
| Kukdo Chemical Co., Ltd. | China | 80 | 200 | 200 | 200 | 200 |
| South Korea | 160 | 160 | 160 | 160 | 160 |
| India | 0 | 40 | 40 | 40 | 40 |
| Huntsman Corporation | China | 64 | 64 | 64 | 64 | 64 |
| USA | 70 | 70 | 70 | 70 | 70 |
| Switzerland | 50 | 120 | 120 | 120 | 120 |
| Brazil | 10 | 10 | 10 | 10 | 10 |
| Nan Ya Electronic Material (Kunshan) Co. Ltd. | China | 247 | 247 | 247 | 247 | 247 |
| Hexion Inc. | Netherlands | 70 | 100 | 100 | 100 | 100 |
| USA | 127 | 127 | 127 | 127 | 127 |
| Spain | 10 | 32 | 32 | 32 | 32 |
| Jiangsu Sanmu Group | China | 170 | 220 | 220 | 220 | 220 |
| Nan Ya Plastics Co Ltd | China | 210 | 210 | 230 | 230 | 230 |
| The Dow Chemical Company | China | 41 | 41 | 41 | 41 | 41 |
| USA | 60 | 60 | 60 | 60 | 60 |
| South Korea | 30 | 30 | 30 | 30 | 30 |
| Germany | 30 | 30 | 30 | 30 | 30 |
| Japan | 40 | 40 | 40 | 40 | 40 |
| Aditya Birla Chemicals Ltd. | India | 44 | 66 | 66 | 90 | 90 |
| Thailand | 38 | 100 | 100 | 100 | 100 |
| Nantong Xincheng Synthetic Material Co Ltd | China | 120 | 130 | 130 | 130 | 130 |
| Nippon Steel Chemical & Material Co., Ltd. | Japan | 100 | 120 | 120 | 120 | 120 |
| NAMA Chemicals | Saudi Arabia | 120 | 120 | 120 | 120 | 120 |
| Zhuhai Hongchang Electronic Material Co Ltd | China | 117 | 117 | 117 | 117 | 117 |
| Chang Chung Plastics Co Ltd | Taiwan | 50 | 100 | 100 | 100 | 100 |
| Jiangsu Yangnong Kumho Chemical Co., Ltd. | China | 75 | 95 | 95 | 95 | 95 |
| Sinopec Baling Petrochemical Co.,Ltd | China | 60 | 80 | 80 | 80 | 80 |
| Kumho P&B Chemicals | South Korea | 70 | 80 | 80 | 90 | 90 |
| Changchun Chemical (Jiangsu) Co., Ltd. | China | 75 | 75 | 75 | 75 | 75 |
| Spolchemie A.S. | Czech Republic | 60 | 60 | 60 | 60 | 60 |
| Alchemie Ltd. | United Kingdom | 60 | 60 | 60 | 60 | 60 |
| Anhui Shanfu New Material Technology Co., Ltd. | China | 58 | 58 | 58 | 58 | 58 |
| Dalian Qihua New Material Co. Ltd. | China | 50 | 50 | 50 | 50 | 50 |
| Atul Limited | India | 30 | 40 | 40 | 50 | 50 |
| Japan Epoxy Resins | Japan | 40 | 40 | 40 | 40 | 40 |
| LEUNA-Harze GmbH | Germany | 40 | 40 | 40 | 40 | 40 |
| Izel Kimya | Turkey | 40 | 40 | 40 | 40 | 40 |
| Ciech Sarzyna | Poland | 30 | 30 | 30 | 30 | 30 |
| SIR Industriale SpA | Italy | 20 | 20 | 20 | 20 | 20 |
| Meghmani Finechem Limited | India | 0 | 0 | 0 | 25 | 25 |
| Others | Rest of Global | 566 | 653 | 668 | 668 | 668 |
| Total |  | 3766 | 4484 | 4519 | 4588 | 4588 |

*Source: TechSci Research*

The increase in the total capacity of epoxy resin from 4484 thousand tonnes in 2020 to 4648 thousand tonnes in 2030 is led by a robust rise in the demand for the product from multiple downstream industries. On account of which, various leading producers are planning to invest in production units either to expand their existing capacities or to set up new plants at different locations globally. For instance, Jiagnsu Sanmu Group, one of the leading epoxy resins producers in China, expanded its capacity by 80 KTPA in Jiangsu province in 2020 which earlier had a total installed capacity of 270 KTPA in China. In addition, Kukdo Chemical Co. Ltd., one of the leading Korean based companies, expanded its epoxy resin production capacity at two of its plant by a total of 90 KTPA in 2020, making its total production capacity to 400 KTPA in 2020. Moreover, it has announced a plan of expanding its capacity in India from 40 KTPA to 100 KTPA by 2024, followed by escalating demand for epoxy resin across the region for various applications and most importantly, for adhesive and coating applications in the construction sector.

**Table 3: Global Epoxy Resin Production, By Company (Thousand Tonnes), 2015-2030F**

**3.1.2. Production By Company**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Company** | **2015** | **2020** | **2021E** | **2025F** | **2030F** |
| Olin Corporation | 324 | 337 | 368 | 408 | 442 |
| Kukdo Chemical (Kunshan) Co., Ltd. | 187 | 238 | 258 | 262 | 291 |
| Nan Ya Electronic Material (Kunshan) Co. Ltd. | 201 | 204 | 213 | 210 | 235 |
| Hexion Inc. | 160 | 180 | 196 | 210 | 236 |
| Huntsman Corporation | 144 | 177 | 179 | 188 | 212 |
| Jiangsu Sanmu Group | 137 | 165 | 175 | 172 | 198 |
| Nan Ya Plastics Co Ltd | 158 | 160 | 187 | 196 | 212 |
| The Dow Chemical Company | 149 | 153 | 156 | 162 | 178 |
| Nantong Xincheng Synthetic Material Co Ltd | 99 | 100 | 106 | 101 | 117 |
| Nippon Steel Chemical & Material Co., Ltd. | 82 | 99 | 97 | 106 | 114 |
| Zhuhai Hongchang Electronic Material Co Ltd | 102 | 91 | 98 | 99 | 111 |
| NAMA Chemicals | 91 | 90 | 88 | 94 | 106 |
| Aditya Birla Chemicals (Thailand) Ltd. | 29 | 74 | 81 | 88 | 92 |
| Jiangsu Yangnong Kumho Chemical Co., Ltd. | 61 | 71 | 76 | 74 | 86 |
| Chang Chung Plastics Co Ltd | 37 | 69 | 77 | 80 | 90 |
| Sinopec Baling Petrochemical Co.,Ltd | 51 | 67 | 69 | 68 | 76 |
| Kumho P&B Chemicals | 55 | 57 | 61 | 72 | 79 |
| Changchun Chemical (Jiangsu) Co., Ltd. | 64 | 57 | 60 | 59 | 68 |
| Grasim Industries Ltd. | 28 | 49 | 50 | 77 | 81 |
| Anhui Shanfu New Material Technology Co., Ltd. | 45 | 48 | 50 | 49 | 55 |
| Spolchemie A.S. | 44 | 44 | 45 | 48 | 53 |
| Alchemie Ltd. | 44 | 42 | 47 | 49 | 54 |
| Dalian Qihua New Material Co. Ltd. | 41 | 41 | 40 | 39 | 45 |
| Izel Kimya | 31 | 34 | 35 | 36 | 38 |
| Atul Ltd. | 19 | 29 | 32 | 44 | 45 |
| Japan Epoxy Resins | 30 | 28 | 29 | 30 | 34 |
| LEUNA-Harze GmbH | 30 | 24 | 26 | 28 | 31 |
| Ciech Sarzyna | 20 | 20 | 23 | 24 | 26 |
| Hindustan Speciality Chemicals | 0 | 16 | 21 | 25 | 25 |
| SIR Industriale | 15 | 14 | 15 | 16 | 18 |
| Kukdo Chemical India Private Limited | 0 | 0 | 22 | 80 | 85 |
| Meghmani Finechem Ltd | 0 | 0 | 0 | 13 | 21 |
| Others | 390 | 469 | 507 | 519 | 567 |
| Total | 2866 | 3246 | 3485 | 3724 | 4119 |



The total production of Epoxy Resin stood at around 3246 thousand tonnes in 2020 and is expected to reach around 4119 thousand tonnes by 2030. The increase in production is attributed to the surge in demand for cost-effective as well as lightweight resin that can be used for various applications. However, the global production of epoxy resin showed a significant dip of around 6.46% in 2020 due to the outbreak of COVID-19, which has caused severe disruption in the supply chain and raw material availability worldwide. As of 2020, nearly 60-65% of the total global production is being constituted by Asia Pacific, followed by Europe. The total production in 2021 is projected to revive to its normal volume following revive in end-user industries and hence overall demand. Following this, the manufacturers are focusing on maximizing their production by investing in new capacities and increasing their operating rate to fulfill a sudden surge in the demand across the globe and witnessed to operate at average rate of 75-80% in 2021 which is further expected to increase their rates in coming years as the demand increases.



Majority of epoxy resin capacities are strategically located in China. Rising industrialization and urbanization in developing nations such as India and China will influence the Epoxy Resin producers to expand the capacity in this region. Also, favorable government policies for renewables like wind and solar energy influences major epoxy resin producers to setup capacity in these countries. On the other hand, Capacities located in developed nations of Western European and North American countries will show a moderate growth in expansion due to the market slowly reaching to its maturity in these regions. Also, government regulation to commercialize capacity is more stringent in these regions compared to Asia Pacific. Europe is the second-largest supplier of Epoxy Resin market, led by the United States. Globally, major producers are Olin Corporation, Hexion, Huntsman Corporation, Dow Chemical, Jiangsu Sammu group, Nanya Electronics. Olin Corporation is one of the oldest & leading producer of epoxy resin.

**Figure 3: Average Operating Efficiency of Indian Companies versus Outside Indian Companies, 2015 – 2030F**

*Source: TechSci Research*

**Table 5: Global Epoxy Resin Capacity, Operating Efficiency, By Company (Percentage), 2015-2030F**

**3.1. 4. Operating Efficiency By Company**



*Source: TechSci Research*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Company** | **2015** | **2020** | **2021** | **2025F** | **2030F** |
| Aditya Birla Chemicals (Thailand) Ltd. | 78% | 74% | 81% | 88% | 92% |
| Alchemie Ltd. | 73% | 70% | 79% | 82% | 90% |
| Anhui Shanfu New Material Technology Co., Ltd. | 77% | 83% | 86% | 85% | 95% |
| Atul Ltd. | 62% | 72% | 80% | 88% | 90% |
| Chang Chung Plastics Co Ltd | 73% | 69% | 77% | 80% | 90% |
| Changchun Chemical (Jiangsu) Co., Ltd. | 86% | 76% | 80% | 78% | 90% |
| Ciech Sarzyna | 65% | 68% | 78% | 80% | 88% |
| Dalian Qihua New Material Co. Ltd. | 83% | 81% | 80% | 78% | 90% |
| Grasim Industries Ltd. | 64% | 75% | 75% | 85% | 90% |
| Hexion Inc. | 77% | 70% | 75% | 81% | 91% |
| Huntsman Corporation | 74% | 67% | 68% | 71% | 80% |
| Izel Kimya | 77% | 85% | 87% | 90% | 95% |
| Japan Epoxy Resins | 74% | 71% | 73% | 75% | 85% |
| Jiangsu Sanmu Group | 80% | 75% | 80% | 78% | 90% |
| Jiangsu Yangnong Kumho Chemical Co., Ltd. | 81% | 75% | 80% | 78% | 90% |
| Kukdo Chemical (Kunshan) Co., Ltd. | 78% | 66% | 72% | 73% | 81% |
| Kukdo Chemical India Private Limited | 0% | 0% | 55% | 80% | 85% |
| Kumho P&B Chemicals | 79% | 72% | 76% | 80% | 88% |
| LEUNA-Harze GmbH | 75% | 59% | 65% | 70% | 78% |
| Meghmani Finechem Ltd | 0% | 0% | 0% | 50% | 85% |
| NAMA Chemicals | 76% | 75% | 73% | 78% | 88% |
| Nan Ya Electronic Material (Kunshan) Co. Ltd. | 81% | 83% | 86% | 85% | 95% |
| Nan Ya Plastics Co Ltd | 75% | 76% | 81% | 85% | 92% |
| Nantong Xincheng Synthetic Material Co Ltd | 83% | 77% | 82% | 78% | 90% |
| Nippon Steel Chemical & Material Co., Ltd. | 82% | 82% | 81% | 88% | 95% |
| Olin Corporation | 75% | 66% | 72% | 80% | 87% |
| Sinopec Baling Petrochemical Co.,Ltd | 86% | 84% | 86% | 85% | 95% |
| SIR Industriale | 73% | 72% | 77% | 80% | 90% |
| Spolchemie A.S. | 74% | 74% | 75% | 80% | 88% |
| The Dow Chemical Company | 74% | 76% | 78% | 81% | 88% |
| Zhuhai Hongchang Electronic Material Co Ltd | 87% | 78% | 84% | 85% | 95% |
| Hindustan Speciality Chemicals | 0% | 53% | 70% | 83% | 83% |
| Others | 69% | 80% | 84% | 81% | 87% |

The operating efficiency of the Epoxy Resin lies between the range of 75-85% at present and it is expected to further increase due to the rising demand and need to increase the production of wind construction & electrical industry. There was a slight decrease in the operating rates of 2020 as compared to 2019 due to the supply chain disruptions and lockdown constraints faced by companies during the coronavirus pandemic. Since 2017, China is operating above 80% capacity. Globally, companies are producing at high operating rates in 2021 compared to last year due to increasing demand for the chemical from the wind energy, electrical, construction industry, construction sector, marine industry, and renewables like wind energy. Moreover, rising investment in the defense sector by major economies drove the companies to operate at higher efficiency. Other factors supporting operating rates include increasing investment in renewables like wind and solar energy in emerging economies in the Asia Pacific region

**Demand By Grade**

**Figure 4: Global Epoxy Resin Demand, By Grade, By Volume, 2015–2030F**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 1414 | 1493 | 1602 | 1655 | 1748 | 1695 | 1833 | 1952 | 2071 | 2194 | 2315 | 2430 | 2548 | 2666 | 2787 | 2911 |
| Semi-Solid | 250 | 261 | 275 | 277 | 288 | 284 | 289 | 307 | 323 | 342 | 357 | 372 | 387 | 401 | 415 | 430 |
| Solid | 1090 | 1138 | 1234 | 1255 | 1328 | 1283 | 1371 | 1460 | 1545 | 1636 | 1727 | 1813 | 1901 | 1988 | 2078 | 2170 |
| **Total** | **2754** | **2891** | **3110** | **3187** | **3365** | **3261** | **3494** | **3719** | **3939** | **4172** | **4400** | **4616** | **4835** | **5055** | **5281** | **5511** |

Liquid type standard Epoxy Resin is manufactured from Bisphenol-A and exhibit excellent adhesion, chemical resistance, heat resistance properties etc. It can be cured together with the various hardeners (Polyamide resin, Aromatic Polyamine, Aliphatic Polyamine and Anhydride Compound), diluents, fillers. Depending on diluents and other additives, different physical properties after curing can be obtained. It is used in Civil Engineering, Consumer Good, Electronics, Energy Sector, Wind Energy, Transportation sector.

Solid Epoxy Resins— including low, medium, high molecular weight and specialty formulations– offer reliability, protection, and performance as per the requirement.

Semi-solid epoxy novolac resin dispersion designed for 2-component coating systems, which Can produce highly crosslinked matrices, providing excellent heat and chemical resistance. Semisolid based epoxy emulsion resin Waterborne paint, adhesive, cement mortar, sizing. It is used in Civil Engineering, Consumer Good, Electronics, Energy Sector, Transportation.

Low viscosity liquid epoxy resin with minimal crystallization tendency offers low surface tension, excellent wetting, and flow. It is used in paint industries, construction, transportation, consumer goods, etc.

**Figure 5: Global Epoxy Speciality Resins (EPS), Demand by Type, By region, 2020**

Epoxy Specialty Resins (EPS) is preferred material for wind Energy due to its stringent properties such as light weight, good adhesion, resistance to fatigue, etc. Globally the wind energy production capacity has increased in last past five years and most of the countries are switching from tradional sources of energy to renewable energy, wind energy contributes a large amount of energy source in renewable energy. Further, many new wind energy capacities are in pipeline across the globe. Further, Coatings and Waterborne coatings contribute 22 percent and 9 percent of global demand of EPS.

**3.1.6. Demand By Type**

**Figure 7: Global Epoxy Resin Market Share, By Type, 2015–2030F**

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*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Type** | **2015** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Bisphenol A Based Resin | 2291 | 2401 | 2579 | 2636 | 2780 | 2689 | 2872 | 3058 | 3229 | 3411 | 3585 | 3747 | 3922 | 4077 | 4246 | 4415 |
| Bisphenol F Based Resin | 95 | 103 | 115 | 118 | 134 | 137 | 150 | 163 | 168 | 193 | 217 | 236 | 237 | 274 | 293 | 315 |
| Epoxy Phenol Novolac Based Resin | 64 | 69 | 72 | 78 | 82 | 81 | 89 | 94 | 103 | 111 | 118 | 124 | 133 | 142 | 151 | 160 |
| Cycloaliphatic Epoxy Based Resin | 56 | 57 | 61 | 61 | 64 | 59 | 65 | 69 | 73 | 79 | 82 | 89 | 96 | 100 | 108 | 116 |
| Others | 248 | 261 | 284 | 294 | 305 | 295 | 319 | 335 | 365 | 379 | 398 | 421 | 445 | 463 | 483 | 505 |
| **Total** | **2754** | **2891** | **3110** | **3187** | **3365** | **3261** | **3494** | **3719** | **3939** | **4172** | **4400** | **4616** | **4835** | **5055** | **5281** | **5511** |

DGBEA Bisphenol A diglycidyl ether (bisphenol A& ECH) accounted for the largest market share, i.e., approximately 85-90%, and is projected to grow at a approx6% CAGR. Among Specialized Epoxy Resins like BPF & ECH, Novolac (Formaldehyde & Phenol), Aliphatic (Aliphatic alcohol) & Glycidylamine (aromatic amines & ECH), the Novolac segment is projected to exhibit the highest CAGR between 10-12, owing to the widespread use of novolac in industrial coating, other grades also forecasted to glow at 5-7 % annually.

**3.1.7. Demand By Application**

**Figure 8: Global Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

*.*

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 1170 | 1238 | 1332 | 1362 | 1440 | 1386 | 1493 | 1596 | 1697 | 1795 | 1902 | 2001 | 2098 | 2198 | 2297 | 2400 |
| Electrical & Electronics | 699 | 737 | 800 | 821 | 871 | 843 | 911 | 973 | 1033 | 1097 | 1159 | 1217 | 1277 | 1336 | 1398 | 1460 |
| Construction | 251 | 262 | 282 | 289 | 307 | 291 | 311 | 332 | 352 | 373 | 394 | 414 | 435 | 454 | 475 | 497 |
| Composite Materials | 328 | 347 | 370 | 380 | 400 | 381 | 407 | 431 | 456 | 482 | 506 | 529 | 554 | 578 | 604 | 630 |
| Adhesives | 172 | 185 | 198 | 204 | 214 | 208 | 223 | 237 | 252 | 267 | 283 | 297 | 311 | 326 | 341 | 356 |
| Others | 134 | 122 | 128 | 131 | 133 | 153 | 148 | 150 | 149 | 159 | 156 | 157 | 161 | 163 | 165 | 169 |
| Total | 2754 | 2891 | 3110 | 3187 | 3365 | 3261 | 3494 | 3719 | 3939 | 4172 | 4400 | 4616 | 4835 | 5055 | 5281 | 5511 |

The Epoxy Resin market is being driven by various end-user industries such as paints & coatings, electrical components, adhesives and many more. Amongst all these end users, the majority of the demand for Epoxy Resin is generated by paints & coatings across the globe. Increasing demand from the bulging construction sector for lightweight and durable adhesive material worldwide, coupled with increasing disposable income across various countries, which is promoting the improvements of the construction sector, which in turn is driving epoxy resin consumption. Paints & coatings applications have garnered around 50% share in 2020 in the global epoxy resin market pushed by significant growth witnessed across the industry. Epoxy resins have been associated with offering strength, durability and resilience while dealing with challenging conditions such as physical impacts, extreme temperatures and corrosive chemicals. These offerings for construction and other downstream sectors are driving the epoxy resin market growth in the coming years.

The rapid growth in the Indian paints and coatings industry (mainly automotive, industrial coatings, Medical Sector & wind energy) is expected to propel the growth of the epoxy resins market during the forecast period. Epoxy resin is extensively used in Electrical and energy distribution systems as adhesives, coatings and sealants, also in the manufacturing of transformers, insulators and bushings (these are used as protective coatings in large generators & on printed circuit board). Sales to downstream users is approx. 28 %. In Commercial construction, it provides particularly strong bonding adhesives, sealants and fillers , epoxy resins are suitable for internal and external use given them strength, durability and chemical resistance of mechanical fixings and to repair bridge & decks.As the largest end-user sector examined, accounting for approx. 9% of total epoxy manufacture sale. Epoxy resin also used in Manufacturing of wind turbine blades as structural elements, as coatings of generators and other components and as adhesives.

**3.1.8. Demand By Sales Channel**

**Figure 9: Global Epoxy Resin Demand, By Sales Channel, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Demand by Sales Channel** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| Direct Company Sale | 1535 | 1615 | 1767 | 1818 | 1931 | 1899 |
| Indirect | 1219 | 1276 | 1343 | 1369 | 1433 | 1362 |
| **Total** | 2754 | 2891 | 3110 | 3187 | 3365 | 3261 |

The major sales channel for Global Epoxy Resin Market is the Direct Sales Channel with a market share of around 58% in 2020 which has been gradually growing since 2015 to 2020 with a market share of around 41% in 2015. As the Epoxy Resin has major application in areas like construction, wind energy, automotive etc., companies prefer direct sales channel over indirect sales channel in order to reduce their logistics costs. For captive epoxy resin manufacturer, the percentage margin through direct sales stands at 28.7% which includes sales through company websites, direct export and direct sales while the margin through indirect sales stands at 26.% which includes sales through distributor or retailer including transportation charges and distributor share. For non captive

epoxy resin manufatcurer, the margin through direct sales stands at 18% while the through indirect sales it stands at 15%.

**3.1.8. Demand By Region**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2015** | **2020F** | **2021F** | **2025F** | **2030F** | **CAGR (2015-2020** | **CAGR (2021E-2030F)** |
| Asia Pacific | 1594 | 2040 | 2200 | 2870 | 3675 | 5.05% | 10.80% |
| China | 1205 | 1571 | 1697 | 2255 | 2936 | 5.46% | 11.58% |
| South Korea | 77 | 91 | 95 | 117 | 151 | 3.35% | 9.72% |
| India | 59 | 103 | 89 | 129 | 193 | 11.86% | 16.76% |
| Others | 254 | 275 | 319 | 370 | 395 | 1.60% | 4.35% |
| Global APAC (Percentage Share) | 58% | 63% | 63% | 65% | 67% |  |  |
| Europe | 507 | 551 | 582 | 675 | 822 | 1.67% | 7.14% |
| Germany | 131 | 154 | 150 | 183 | 235 | 3.34% | 9.36% |
| Spain | 26 | 48 | 50 | 59 | 74 | 13.21% | 8.25% |
| Italy | 69 | 65 | 65 | 76 | 96 | -1.01% | 8.24% |
| Others | 282 | 283 | 317 | 357 | 416 | 0.11% | 5.60% |
| Global Europe (Percentage Share) | 18% | 17% | 17% | 15% | 15% |  |  |
| North America | 299 | 317 | 335 | 397 | 465 | 1.16% | 6.81% |
| USA | 241 | 251 | 257 | 307 | 383 | 0.84% | 8.30% |
| Canada | 37 | 35 | 28 | 34 | 41 | -1.08% | 7.52% |
| Others | 22 | 31 | 49 | 56 | 42 | 7.55% | -3.36% |
| Global North America (Percentage Share) | 11% | 10% | 10% | 9% | 8% |  |  |
| South America | 80 | 83 | 88 | 105 | 124 | 0.81% | 7.20% |
| Brazil | 59 | 61 | 64 | 79 | 91 | 0.72% | 7.30% |
| Others | 21 | 22 | 24 | 26 | 33 | 1.08% | 6.90% |
| Global South America (Percentage Share) | 3% | 3% | 3% | 2% | 2% |  |  |
| Middle East and Africa | 274 | 271 | 289 | 352 | 425 | -0.21% | 8.02% |
| Saudi Arabia | 55 | 55 | 58 | 73 | 98 | 0.01% | 11.17% |
| Turkey | 21 | 25 | 26 | 32 | 43 | 3.50% | 10.61% |
| Others | 198 | 191 | 205 | 247 | 284 | -0.70% | 6.70% |
| Global MEA (Percentage Share) | 10% | 8% | 8% | 8% | 8% |  |  |

Region wise, Asia Pacific holds the major share of the global demand for Epoxy Resin with a market share of 62.56% in 2021, which is expected to rise gradually during the forecast period to around 66.68% in 2030. Epoxy Resin has major applications in areas like wind energy, automotive, Electrical & electronice and other areas having a demand for high-performance materials with chemical resistance properties. Asia pacific, being home to the China & India are the developing & world’s most populated country , so demand can direclly linked to this & simultaneously expected to have high demand in the forecast period. With the countries moving towards more and more sustainable energy solutions, the demand for wind energy is expected to grow exponentially in Asia Pacific during the forecast period; hence the region will keep the lion’s share of global demand for Epoxy Resin. North America and Europe have a demand share of around 9.71% & 16.68 % respectively.

**3.1.10. Sales By Company**

**Figure 16: Global Epoxy Resin Sales, By Company, By Volume, 2020**

*Others include Poliya, Hexion Inc., DIC Corporation, Saudi Arabia Industrial Resins Ltd.., Reinhold GmbH, Interplastic Corporatio, Allnex Group, Sewon Chemical, Innovative Resins Pvt. Ltd., Orson Chemicals etc.*

*Source: TechSci Research*

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**ASIA PACIFIC EPOXY RESIN MARKET OUTLOOK**



**3.2.1. Asia Pacific Demand Supply Outlook**

**2021E-2030F**

**CAGR**

**5.86% By Volume**

**Figure 17: Asia Pacific Epoxy Resin Demand, By Volume (Thousand Tonnes), 2015–2030F**

**2015-2020**

**CAGR**

**5.05%% By Volume**

*Source: TechSci Research*

The demand for Epoxy Resin is expected to increase in the Asia Pacific region due to the rise in demand from the end-user industries such as in powder coating applications and flooring in expanding building and construction sector. The highest demand for Epoxy Resin is generated from the Asia Pacific region and accounts for more than 45% of market share due to the growing population and construction activities across the region, majorly in developing countries like China and India. Epoxy Resin is used widely in the construction sector, adhesives, composites, and other applications owing to its thermal stability, chemical & moisture resistivity, superior durability, mechanical strength, and other properties. Also, reduced GST rate from 28% to 18% has created growth in the paint market across Asian countries like India and China, which has created an opportunity for the paint manufacturers to pass the cost benefits on customers creating a higher growth in demand for paints.

Asia Pacific contributes the highest percent demand by capacity, volume & usage, of which China has been the largest producer and user of Epoxy Resin and covers almost 80% of the APAC Market. With the increase in income of the middle-class population, demand for electronic products is projected to grow in the future, therefore driving the epoxy market as well.

China & India are fast growing economy, with an ample opportunities for new business project, EPC (Engineering, Procurement & construction), Joint venture (Domestic & international)etc project. Simultaneously, this will increase the demand for the paint & coating, which will derive the demand of the epoxy market.

**3.2.1.1. Capacity and Production**

**Figure 18: Asia Pacific Epoxy Resin Capacity & Production (Thousand Tonnes), 2015-2030F**

Asia pacific contribute the highest % Demand by Capacity, Volume & Usage, of which China been the largest producer & User of Epoxy resin, covers almost 80 % of the APAC Market. are the fastest growing economiesAlso With the increase in income of middle class population, demand of electronic products is projected to grow in future, therefore driving the epoxy market too.

The total production of Epoxy Resin stood at around 2134 thousand tonnes in 2020 and is expected to reach around 3020 thousand tonnes by the forecast period 2030. Major capacities of Epoxy Resin are in China, Northeast Asia, Europe & North America. While very small capacity of Epoxy resin is in Indian Sub-continent, Australia and Africa. In Asia-Pacific, China and Taiwan have become market leaders in epoxy resin manufacturing with a total capacity of around 2246 thousand tonnes and 310 thousand tonnes, respectively, as of 2020. Various producers including Kukdo Chemical (Kunshan) Co., Ltd., Jiangsu Sanmu Group and others are planning capacity addition in coming years in China.

**3.2.1.2. Operating Efficiency**

**Figure 19: Asia Pacific Epoxy Resin Operating Efficiency (Percentage), 2015-2030F**

**Figure 20: Asia Pacific Growth Trend in Foreign Direct Investment, (USD Billion), 2010, 2019 & 2025F**

**3.2.1.3. Demand By Application**

**Figure 21: Asia Pacific Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 702 | 747 | 825 | 850 | 907 | 897 | 971 | 1047 | 1122 | 1197 | 1278 | 1351 | 1423 | 1497 | 1570 | 1646 |
| Electrical & Electronics | 450 | 476 | 529 | 546 | 583 | 578 | 625 | 673 | 719 | 769 | 818 | 863 | 909 | 954 | 1002 | 1050 |
| Construction | 144 | 153 | 170 | 176 | 190 | 184 | 199 | 214 | 228 | 244 | 260 | 274 | 289 | 304 | 319 | 334 |
| Composite Materials | 140 | 147 | 164 | 169 | 181 | 178 | 192 | 207 | 221 | 237 | 252 | 265 | 280 | 294 | 309 | 324 |
| Adhesives | 100 | 105 | 116 | 121 | 128 | 128 | 138 | 148 | 159 | 170 | 181 | 191 | 201 | 212 | 222 | 233 |
| Others | 58 | 55 | 60 | 62 | 64 | 76 | 77 | 78 | 77 | 83 | 82 | 82 | 84 | 85 | 86 | 88 |
| **Total** | **1594** | **1683** | **1864** | **1924** | **2053** | **2040** | **2200** | **2367** | **2526** | **2700** | **2870** | **3027** | **3186** | **3346** | **3509** | **3675** |

**3.2.1.4. Demand By Type**

**Figure 22: Asia Pacific Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Type** | **2015** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Bisphenol A Based Resin | 1348 | 1421 | 1573 | 1622 | 1732 | 1718 | 1846 | 1986 | 2111 | 2247 | 2378 | 2496 | 2626 | 2735 | 2857 | 2979 |
| Bisphenol F Based Resin | 55 | 61 | 71 | 73 | 87 | 93 | 102 | 112 | 114 | 136 | 158 | 172 | 170 | 203 | 218 | 237 |
| Epoxy Phenol Novolac Based Resin | 24 | 26 | 28 | 34 | 35 | 37 | 41 | 43 | 49 | 53 | 58 | 60 | 65 | 70 | 74 | 79 |
| Cycloaliphatic Epoxy Based Resin | 19 | 20 | 22 | 22 | 24 | 22 | 25 | 27 | 29 | 33 | 34 | 38 | 43 | 44 | 50 | 56 |
| Others | 148 | 155 | 169 | 173 | 175 | 170 | 187 | 198 | 223 | 231 | 244 | 261 | 282 | 295 | 310 | 325 |
| **Total** | **1594** | **1683** | **1864** | **1924** | **2053** | **2040** | **2200** | **2367** | **2526** | **2700** | **2870** | **3027** | **3186** | **3346** | **3509** | **3675** |

**Figure 23: Asia Pacific Epoxy Resin Demand, By Grade, By Volume, 2015–2030F**

**3.2.1.5. Demand By Grade**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 799 | 849 | 935 | 970 | 1034 | 1032 | 1115 | 1200 | 1282 | 1371 | 1458 | 1539 | 1620 | 1702 | 1787 | 1872 |
| Semi-Solid | 135 | 142 | 155 | 159 | 168 | 168 | 179 | 192 | 204 | 217 | 229 | 241 | 252 | 263 | 274 | 285 |
| Solid | 660 | 692 | 774 | 794 | 851 | 840 | 907 | 974 | 1040 | 1112 | 1183 | 1248 | 1314 | 1381 | 1449 | 1519 |
| **Total** | **1594** | **1683** | **1864** | **1924** | **2053** | **2040** | **2200** | **2367** | **2526** | **2700** | **2870** | **3027** | **3186** | **3346** | **3509** | **3675** |

**Figure 24: Asia Pacific Epoxy Resin Demand, By Sales Channel, By Volume, 2015–2030F**

**3.2.1.7. Demand By Sales Channel**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Demand by Sales Channel** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| Direct Company Sale | 927 | 984 | 1113 | 1165 | 1255 | 1266 |
| Indirect | 668 | 699 | 751 | 758 | 798 | 774 |
| **Total** | **1594** | **1683** | **1864** | **1924** | **2053** | **2040** |

**3.1.9. Sales By Company**

**Figure 25: Asia Pacific Epoxy Resin Sales, By Company, By Volume, 2020**

*Source: TechSci Research*

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**EUROPE**

**EPOXY RESIN MARKET OUTLOOK**



**3.2.3. Europe Epoxy Resin Demand Supply Outlook**

**Figure 30: Europe Epoxy Resin Demand, By Volume (Thousand Tonnes), 2015–2030F**

**2021E-2030F**

**CAGR**

**3.91% By Volume**

**2015-2020**

**CAGR**

**1.67% By Volume**

*Source: TechSci Research*

European paint industry is struggling with peak price of epoxy resin due to dramatic supply shortage of raw material supply. In addition to the corona pandemic, it has massive impact on the company’s business result, which anticipated to witness slow growth during short term compared to historical period, this has created a colossal disruption across the globe in 2020.

According to the German Coatings and Printing Inks Association (VdL), for roughly 270 companies, prices on the world market, particularly for epoxy resins and polyester resins, have gone up so dramatically due to surge in total demand in the region post peak of pandemic in 2020 which have caused a significant impact on business results and overall demand in Europe.

However, the gradual improvement in demand across Europe is anticipated in view of downstream industries operating at higher operating rate to fulfil swelling demand

**Figure 31: Europe Construction Market Size, By Value (USD Billion), 2016-2020**

*Source: EuroStat*

**3.2.3.1. Capacity And Production**

**Figure 32: Europe Epoxy Resin Capacity & Production (Thousand Tonnes), 2015-2030F**

*Source: TechSci Research*

Europe’s current capacity of Epoxy Resin stood at 938 thousand tonnes. Major Epoxy Resin players in Europe include Olin Corporation, Hexion Inc, Huntsman Corporation, Alchemie & Spolchemi.

**Figure 9: Europe Epoxy Resin Production Operating Rate (Percentage), 2015-2030F**

These companies hold approximately 62% share of the total capacity in Europe as of 2020. Further, INEOS Composites acquired Ashland Holdings resin business in 2019.

Olin Corporation has 245 MTPA facility in Germany and 20 MTPA facility in Italy,. Another major player, Huntsman Corporation has 100 MTPA capacity in Switzerland.. Many new players are expected to enter

Europe Epoxy Resin market due to favourable government policies and strong demand of Epoxy Resin led by growing demand of renewable energy such as wind energy, solar energy which has Epoxy Resin application.

**3.2.3.1. Operating Efficiency**

**Figure 33: Europe Epoxy Resin Operating Efficiency (Percentage), 2015-2030F**

*Source: TechSci Research*

**Table 6: European Countries Real Estate Investment, 2020 (USD Billion)**

|  |  |
| --- | --- |
| **Countries** | **Investment (USD Billion)** |
| Germany | 57 |
| France | 28 |
| Netherland | 14 |
| Spain | 12 |
| Italy | 9 |

*Source: TechSci Research*

**3.2.3.3. Demand By Application**

*Others include Renewables, Marine etc*

*Source: TechSci Research*

**Figure 34: Europe Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 200 | 210 | 220 | 227 | 239 | 216 | 232 | 242 | 252 | 262 | 272 | 283 | 295 | 307 | 320 | 334 |
| Electrical & Electronics | 101 | 106 | 112 | 118 | 124 | 113 | 124 | 129 | 134 | 140 | 145 | 151 | 157 | 163 | 170 | 177 |
| Construction | 38 | 38 | 40 | 41 | 43 | 38 | 40 | 41 | 43 | 45 | 46 | 48 | 50 | 52 | 55 | 57 |
| Composite Materials | 96 | 103 | 107 | 111 | 115 | 106 | 112 | 116 | 121 | 125 | 130 | 135 | 140 | 146 | 152 | 158 |
| Adhesives | 30 | 34 | 36 | 37 | 38 | 35 | 37 | 39 | 40 | 42 | 44 | 45 | 47 | 49 | 51 | 54 |
| Others | 42 | 39 | 40 | 40 | 40 | 42 | 37 | 37 | 37 | 39 | 38 | 39 | 40 | 41 | 41 | 42 |
| **Total** | **507** | **530** | **555** | **574** | **599** | **551** | **582** | **604** | **628** | **652** | **675** | **701** | **729** | **758** | **789** | **822** |

The paints & coating segment accounted for the major share followed by electrical & electronics application in Europe Epoxy Resin market as of 2020, which is further expected to hold its dominance during the forecast period owing to the ban imposed on the usage of bisphenol. Consequently, Epoxy Resin has been used by paint manufacturers as a key raw material. Apart from this, epoxy resins witnessed decent growth during 2015-2020 and are expected to witness robust growth in the forecast period on account of their growing utilization in producing adhesives, electrical, electronics and paints industries.

*Source: TechSci Research*

**Figure 35: Europe Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

**3.2.3.4. Demand By Type**

Europe Epoxy Resin type is dominated by Bisphenol-A, F, S due to its extensive use in the paint & coating, construction industry, electrical & electronics industries & automotive industries. where it is used as a coating material in tankers, pipes preventing them from corrosion, chemicals, and heat. It is used in construction industries as adhesives & epoxy flooring etc. Novolac and brominated Epoxy Resin together contribute around 30-35% share of the total region’s demand. Increasing industrialization and rising investments in the renewable sector increased the market for bisphenol- A, F, Epoxy resin in the region. Major Epoxy Resin producers in the region manufacture Bisphenol- F as Bisphenol- A, which has been banned for some of the application /or area due to its carcinogenic property (like Infant Bottles, Food packaging, Utensils etc.)

**3.2.3.5. Demand By Sales Channel**

**Figure 36: Europe Epoxy Resin Demand, By Sales Channel, By Volume, 2015–2020F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Demand by Sales Channel** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| Direct Company Sale | 284 | 295 | 309 | 310 | 322 | 300 |
| Indirect | 222 | 236 | 246 | 264 | 277 | 250 |
| **Total** | 507 | 530 | 555 | 574 | 599 | 551 |

**3.2.2.4. Demand By Grade**

**Figure 37: Europe Epoxy Resin Demand, By Grade, By Volume, 2015–2030F**

**3.2.2.4. Demand By Type**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 251 | 265 | 279 | 297 | 314 | 284 | 317 | 329 | 344 | 358 | 371 | 386 | 402 | 419 | 437 | 457 |
| Semi-Solid | 63 | 66 | 67 | 64 | 65 | 63 | 56 | 58 | 60 | 62 | 63 | 65 | 67 | 69 | 71 | 73 |
| Solid | 193 | 199 | 209 | 212 | 221 | 203 | 209 | 217 | 224 | 233 | 241 | 250 | 260 | 270 | 281 | 292 |
| **Total** | **507** | **530** | **555** | **574** | **599** | **551** | **582** | **604** | **628** | **652** | **675** | **701** | **729** | **758** | **789** | **822** |

Europe Epoxy Resin type is dominated by Liquid & solid Epoxy Resin, due to its extensive use in the Construction Sector ( Flooring) & paint & Coating (Wind Rotor Blades, Marine Coating & Automotive Coating) )( preventing them from corrosion, chemicals, and heat), this all covers approx. 90-95 % of the market. Increasing industrialization and rising investments in the renewable sector increased the market for bisphenol- A, F, S Epoxy usage in the region. Major Epoxy Resins producers in the region manufactures Bisphenol- F as Bisphenol- A has been banned due to its carcinogenic property.

**Latest Developments:**

**December 2020:** Sicomin Epoxy Systems has initiated a new marine collaboration and invented a novel bio foaming epoxy. The firm's epoxy resins has been nominated for ENATA's high-performance Foiler motor yacht draft. The yacht is built of permeated carbon fiber and epoxy resin.

**April 2021** Sicomin, the leading formulator and supplier of bio-based epoxy resin systems and 9re retardant (FR) epoxy solutions is proud to announce the launch of its new SR FireGreen 37 FR hand laminating resin. This latest addition to the market leading GreenPoxy™ range of bio-epoxies combines exceptional 9re performance with a more sustainable formulation, featuring 25% plant-based carbon content

**November 2020:** Sika AG, a significant market leader, further expanded its manufacturing capacity in the United Arab Emirates by contracting a novel manufacturing facility in Dubai. Sika is determined to enlarge its manufacturing facilities at the Dubai site to curtail delivery times, upsurge tractability in production, enhance cost structures, and decrease inventories. The locally manufactured epoxy resins are an essential component of Sika's flooring solutions

**3.2.3.7. Sales By Company**

**Figure 38: Europe Epoxy Resin Sales, By Company, By Volume, 2020**

*Source: TechSci Research*

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**NORTH AMERICA EPOXY RESIN MARKET OUTLOOK**



**Figure 39: North America Epoxy Resin Demand, By Volume (Thousand Tonnes), 2015–2030F**

**3.2.4. North America Demand Supply Outlook**

*Source: TechSci Research*

In North America, Epoxy resin is used robust growth in paints & coatings sector has witnessed backed by increasing demand from end-user industries which include marine, automotive and aerospace. Epoxy Resin is majorly being used as powder coating across these sectors to provide additional protection to the surfaces owing to Epoxy Resin’s excellent adhesive nature, toughness, water-resistivity and other attributes. The escalation in these industries across North America and superior Epoxy Resin’s properties are further anticipated to boost the Epoxy Resin overall market demand in the forecast period 2030 which is projected to cross over 450 thousand tonnes by 2030 in the region

North America is the third largest market Globally after Asia-Pacific & Europe. Countries Include for the Analysis is Texas, Alabama, Roberta, Canada. This region known for its technological development & product innovation, which motivates manufacturer to produce the high quality product in market

**3.2.4.1. Capacity and Production**

**Figure 40: North America Epoxy Resin Capacity & Production (Thousand Tonnes), 2015-2030F**

**3.2.4.2. Operating Efficiency**

*Source: TechSci Research*

*Source: TechSci Research*

**Figure 41: North America Epoxy Resin Operating Efficiency (Percentage), 2015-2030F**

Epoxy resin is one of the most widely used chemicals globally in the plastic products segment. Many Research been going on for its properties to enhance, Its changeable physical states, cross-linking properties with Diluents, Fillers, curing agents, and so on, benefit the production & demand of wide range of materials, with a unique mix of properties (flame retardancy; more weather, thermal, and chemical resistivity; high adhesion & strength; and so on).

Operating efficiency is North America region is approximately stagnant (i.e. between 70-75 %), there is dip in operating efficiency been seen in year 2020 due to Covid 19 Pandemic.

**3.2.4.3. Demand By Application**

**Figure 42: North America Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

*Others include Renewables, Marine etc*

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 127 | 132 | 136 | 139 | 144 | 132 | 141 | 148 | 155 | 161 | 169 | 175 | 181 | 187 | 193 | 199 |
| Electrical & Electronics | 58 | 60 | 62 | 64 | 66 | 61 | 66 | 69 | 72 | 76 | 79 | 82 | 85 | 87 | 90 | 92 |
| Construction | 25 | 25 | 26 | 27 | 28 | 25 | 27 | 28 | 29 | 30 | 32 | 33 | 34 | 35 | 36 | 37 |
| Composite Materials | 57 | 60 | 62 | 63 | 65 | 62 | 65 | 68 | 72 | 75 | 78 | 81 | 84 | 86 | 89 | 91 |
| Adhesives | 19 | 21 | 22 | 22 | 23 | 21 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| Others | 13 | 10 | 10 | 11 | 11 | 14 | 14 | 13 | 13 | 14 | 13 | 13 | 13 | 13 | 13 | 13 |
| **Total** | **299** | **309** | **318** | **326** | **337** | **317** | **335** | **350** | **367** | **382** | **397** | **412** | **426** | **439** | **452** | **465** |

In Past major construction work & expansion in electrical and Electronic region has been observed. Also this region is known for its technological development & inovation, which enable manufacturer to make the high quality resin with wide range of properties. The major factor driving the market is current & emerging application (Electrical Application, superior & modern structure of construction infrastructure).

By Application wise, North America region is dominated by Paints & Coating with approx 40 % of the share, followed by Electrical & Composite material.

**3.2.4.4. Demand By Type**

**Figure 43: North America Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Type** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Standard Epoxy Resin | 286 | 295 | 304 | 312 | 323 | 304 | 321 | 336 | 353 | 368 | 383 | 398 | 412 | 425 | 438 | 451 |
| Specialized Epoxy Resin | 13 | 14 | 14 | 14 | 14 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 |
| **Total** | **299** | **309** | **318** | **326** | **337** | **317** | **335** | **350** | **367** | **382** | **397** | **412** | **426** | **439** | **452** | **465** |

Industry standard bisphenol A-based liquid epoxy resin Offers excellent mechanical, thermal and chemical resistance properties in multiple applications, Shows improved reactivity versus competitive alternatives. This can further be formulized with diluent, hardeners, fillers or solvents as per the requirement, which can be used in different applications like electrical encapsulation applications. This standard Epoxy resin covers approx. 90-95 % of the market.

Remaining Specialized epoxy resin covers smaller part of the epoxy resin exhibits excellent corrosion and chemical resistance along with good mechanical properties, which is used for Electrical laminate, as an adhesion promote.

**Figure 44: North America Epoxy Resin Demand, By Sales Channel, By Volume, 2015–2020F**

**3.2.4.5. Demand By Sales Channel**

*Source: TechSci Research*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Demand by Sales Channel** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| Direct Company Sale | 149 | 153 | 159 | 162 | 169 | 158 |
| Indirect | 150 | 156 | 160 | 165 | 168 | 159 |
| **Total** | 299 | 309 | 318 | 326 | 337 | 317 |

Epoxy resins have a very wide range of applications in the industry. Its properties gaining pace in the paint & coating sector. Construction sector is one of the main consumer of the epoxy resin, commercial construction has been gaining its pace in form of offices, malls, restaurant etc. . The distribution channel covers via traders, suppliers, distributers & wholesalers with approx. 50 % of the product. Else left product is via direct company sale.

**3.2.4.6. Grade**

**Figure 45: North America Epoxy Resin Demand, By Grade, By Volume, 2015–2030F**

*Source: TechSci Research*

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 166 | 173 | 178 | 183 | 189 | 178 | 188 | 197 | 207 | 216 | 225 | 234 | 242 | 250 | 258 | 266 |
| Semi-Solid | 31 | 32 | 33 | 33 | 34 | 32 | 33 | 35 | 36 | 37 | 39 | 40 | 41 | 42 | 43 | 44 |
| Solid | 102 | 104 | 107 | 110 | 114 | 107 | 113 | 118 | 123 | 128 | 133 | 138 | 143 | 147 | 151 | 156 |
| **Total** | **299** | **309** | **318** | **326** | **337** | **317** | **335** | **350** | **367** | **382** | **397** | **412** | **426** | **439** | **452** | **465** |

North America covers the max. main market of the USA (i.e. The increasing consumption by these application industries, technological advancements, and the growing demand from the aerospace Industry are expected to be the key influencing factors for the North American epoxy resin market approximately 80-85), Liquid epoxy resin demands is highest due to construction project. Almost 21.34% of the total epoxy resin demand was from the electrical and electronics applications segment in 2021, with the composites and adhesives segments projected to be the fastest-growing end-use segments, primarily due to rapidly growing demand from these industries. The increasing consumption by these application industries, technological advancements, and the growing demand from the aerospace Industry are expected to be the key influencing factors for the North American epoxy resin market

**3.2.4.7. Sales By Company**

**Figure 46: North America Epoxy Resin Sales, By Company, By Volume, 2020**

*Source: TechSci Research*

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**SOUTH AMERICA EPOXY RESIN MARKET**

**OUTLOOK**



**Figure 47: South America Epoxy Resin Demand, By Volume (Thousand Tonnes), 2015–2030F**

**2021E-2030F**

**CAGR**

**3.94% By Volume**

**2015-2020**

**CAGR**

**0.81% By Volume**

*Source: TechSci Research*

A significant growth in South America’s Epoxy Resin market was witnessed which stood at around 137 thousand tonnes as of 2020 and is further projected to grow at a significant CAGR during the forecast period. The anticipated growth in the sector is attributed to the increasing manufacturing sector and industrialization in the region. As of 2020, the major Epoxy Resin’s demand in the region emanates from Brazil, followed by Argentina. The dip in total Epoxy Resin demand in 2020 was reported due to the COVID-19 outbreak, followed by halt in construction activities and steep fall in demand from other downstream industries across the region.

Additionally, a rise in disposable income of the average middle class across the region followed by noticeable urbanization, growing rural market and launch of many innovative products (like eco-friendly, odour free and dust & water-resistant paints) are other major drivers that are propelling the demand for paints & coatings industry which is the major driving factor for epoxy resin market growth in the region as of 2020.

**3.2.5.1. Capacity and Production**

**Figure 48: South America Epoxy Resin Capacity & Production (Thousand Tonnes), 2015-2030F**

*Source: TechSci Research*

**3.2.5.2. Operating Efficiency**

*Source: TechSci Research*

**Figure 49: South America Epoxy Resin Operating Efficiency(Percentage), 2015-2030F**

**3.2.5.3. Demand By Application**

*Others include Renewables, Marine etc.*

*Source: TechSci Research*

**Figure 50: South America Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 31 | 33 | 32 | 34 | 34 | 32 | 34 | 36 | 38 | 39 | 41 | 43 | 44 | 46 | 47 | 49 |
| Electrical & Electronics | 17 | 18 | 18 | 19 | 19 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 26 | 27 |
| Construction | 9 | 9 | 9 | 10 | 10 | 9 | 10 | 10 | 11 | 11 | 12 | 12 | 13 | 13 | 13 | 14 |
| Composite Materials | 9 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 12 | 12 | 13 | 13 | 14 | 14 | 15 | 15 |
| Adhesives | 6 | 6 | 6 | 7 | 6 | 6 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 |
| Others | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 |
| **Total** | **80** | **85** | **82** | **86** | **85** | **83** | **88** | **92** | **96** | **101** | **105** | **109** | **112** | **116** | **120** | **124** |

**3.2.5.4. Demand By Type**

**Figure 51: South America Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

*Source: TechSci Research\*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Type** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Standard Epoxy Resin | 75 | 80 | 78 | 82 | 81 | 79 | 83 | 88 | 92 | 96 | 100 | 104 | 107 | 111 | 115 | 119 |
| Specialized Epoxy Resin | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Total** | **80** | **85** | **82** | **86** | **85** | **83** | **88** | **92** | **96** | **101** | **105** | **109** | **112** | **116** | **120** | **124** |

**3.2.5.5. Demand By Sales Channel**

**Figure 52: South America Epoxy Resin Demand, By Sales Channel, By Volume, 2015–2030F**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Demand by Sales Channel** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| Direct Company Sale | 45 | 48 | 47 | 49 | 49 | 47 |
| Indirect | 35 | 37 | 35 | 37 | 37 | 36 |
| **Total** | **80** | **85** | **82** | **86** | **85** | **83** |

Epoxy resins have a very wide range of applications in the industry. Its properties gaining pace in the paint & coating sector. Construction sector is one of the main consumer of the epoxy resin, commercial construction has been gaining its pace in form of offices, malls, restaurant etc. The distribution channel covers via traders, suppliers, distributers & wholesalers with approx. 50 % of the product. Else left product is via direct company sale

**56Grade**

**Figure 53: South America Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 46 | 49 | 48 | 51 | 50 | 48 | 51 | 53 | 56 | 59 | 61 | 63 | 66 | 68 | 70 | 73 |
| Semi-Solid | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 |
| Solid | 27 | 29 | 28 | 29 | 29 | 28 | 30 | 31 | 33 | 34 | 35 | 37 | 38 | 39 | 40 | 42 |
| **Total** | **80** | **85** | **82** | **86** | **85** | **83** | **88** | **92** | **96** | **101** | **105** | **109** | **112** | **116** | **120** | **124** |

North America covers the max. main market of the USA (The increasing consumption by these application industries, technological advancements, and the growing demand from the aerospace Industry are expected to be the key influencing factors for the North American epoxy resin market ), Liquid epoxy resin demands is highest due to construction project. Almost 21.34% of the total epoxy resin demand was from the electrical and electronics applications segment in 2021, with the composites and adhesives segments projected to be the fastest-growing end-use segments, primarily due to rapidly growing demand from these industries. The increasing consumption by these application industries, technological advancements, and the growing demand from the aerospace Industry are expected to be the key influencing factors for the North American epoxy resin market

**Figure 54: South America Epoxy Resin Sales, By Company, By Volume, 2020**

**3.2.5.7. Sales By Company**

*Source: TechSci Research*

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**MIDDLE EAST & AFRICA EPOXY RESIN MARKET**

**OUTLOOK**



**Figure 55: Middle East & Africa Epoxy Resin Demand, By Volume (Thousand Tonnes), 2015–2030F**

**3.2.6. Middle East & Africa Epoxy Resin Demand Supply Outlook**

**2021E-2030F**

**CAGR**

**4.38% By Volume**

**2015-2020**

**CAGR**

**-0.21% By Volume**

*Source: TechSci Research*

The demand for Epoxy Resin in MEA has shown an increasing trend from the past few years and is estimated to be nearly 175 thousand tonnes in 2020, which is further anticipated to grow during the forecast period 2025. The increase in demand is attributed to the rising demand for composites manufacturing in the region for the number of applications, including aerospace structure & other composite parts. This would spur the demand for Epoxy Resins in the MEA region. Epoxy Resins can also be coated and blended with other Epoxy Resins as well for advanced properties such as high mechanical strength, superior electrical properties etc. hence suitable to use in repairing concrete and other structures.

**3.2.6.1. Capacity, Production**

**Figure 56: Middle East & Africa Epoxy Resin Capacity & Production (Thousand Tonnes), 2015-2030F**

*Source: TechSci Research*

The Epoxy resin market is bound with the developing countries due to their co relation with industrialization & infrastructure development. The production capacity of South America Market for epoxy resin in 2015 was 33.50 thousand Tonnes & with little dip was seen in 2020 (due to covid 19 outbreak) & is projected to reach 38.20 in 2030 with a CAGR of 3.94%. Brazil dominates the South America market with 60% share.

**3.2.6.2. Operating Efficiency**

**Figure 57: Middle East & Africa Epoxy Resin Operating Efficiency (Percentage), 2015-2030F**

The Operating efficiency for production remains between 77 -80 % & projected to increase to 80-88 % as per the increase in demand. Key Companies in South America Market are Olin Corporation, Dow Chemical, Huntsman Corporation BASF SE (Germany), and 3M (U.S.).

*Source: TechSci Research*

**Figure 58: Middle East & Africa Epoxy Resin Demand, By Application, By Volume, 2015–2030F**

**3.2.6.3. Demand By Application**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by End Use (%)** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Paints & Coatings | 110 | 115 | 118 | 112 | 117 | 108 | 116 | 123 | 130 | 135 | 142 | 148 | 154 | 161 | 166 | 173 |
| Electrical & Electronics | 73 | 76 | 78 | 74 | 78 | 72 | 77 | 82 | 86 | 90 | 94 | 98 | 102 | 106 | 110 | 114 |
| Construction | 35 | 37 | 38 | 36 | 38 | 34 | 37 | 39 | 41 | 43 | 45 | 46 | 48 | 50 | 52 | 54 |
| Composite Materials | 26 | 27 | 28 | 26 | 28 | 26 | 28 | 29 | 31 | 32 | 34 | 35 | 37 | 38 | 40 | 41 |
| Adhesives | 17 | 18 | 18 | 18 | 18 | 17 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Others | 13 | 12 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 |
| **Total** | **274** | **284** | **292** | **277** | **290** | **271** | **289** | **306** | **322** | **337** | **352** | **367** | **382** | **396** | **410** | **425** |

Epoxy resins are used in an increasing number of markets – from Paints and coatings, Adhesives, Composites, Electrical & electronics, Wind Turbine and a number of other segments. South American Market is derived by paints & coatings and electrical & electronics industries. Demands in Aerospace industries for Epoxy based Composite is expected to drive the market further.

Epoxy resins-based composites contribute to in flexibility in designing aerodynamically efficient airframes, which also reduce the overall weight of an aircraft.

Increasing growth of the epoxy resin market has been driven by growth in end-user industries. Besides that, the South America wind energy market is development is also seen as one of the major market drivers for epoxy resins

**Figure 59: Middle East & Africa Epoxy Resin Demand, By Type, By Volume, 2015–2030F**

**3.2.6.4. Demand By Type**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Type** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Standard Epoxy Resin | 256 | 266 | 272 | 260 | 272 | 255 | 272 | 289 | 304 | 318 | 333 | 347 | 361 | 375 | 389 | 403 |
| Specialized Epoxy Resin | 18 | 19 | 19 | 18 | 18 | 16 | 17 | 18 | 18 | 19 | 20 | 20 | 21 | 21 | 21 | 22 |
| **Total** | **274** | **284** | **292** | **277** | **290** | **271** | **289** | **306** | **322** | **337** | **352** | **367** | **382** | **396** | **410** | **425** |

**3.2.6.5. Demand By Sales Channel**

**Figure 60: Middle East & Africa Epoxy Resin Demand, By Sales Channel, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Demand by Sales Channel** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| Direct Company Sale | 130 | 135 | 140 | 132 | 137 | 128 |
| Indirect | 144 | 149 | 152 | 145 | 153 | 143 |
| **Total** | 379 | 402 | 436 | 406 | 414 | 366 |

**3.2.6.6. Demand By Grade**

**Figure 61: Middle East & Africa Epoxy Resin Demand, By Grade, By Volume, 2015–2030F**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand by Grade** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Liquid | 152 | 157 | 161 | 154 | 162 | 152 | 163 | 173 | 182 | 191 | 200 | 208 | 217 | 226 | 234 | 244 |
| Semi-Solid | 14 | 14 | 15 | 14 | 14 | 14 | 14 | 15 | 15 | 17 | 18 | 18 | 18 | 19 | 19 | 19 |
| Solid | 108 | 113 | 116 | 110 | 114 | 105 | 113 | 119 | 125 | 129 | 135 | 140 | 146 | 152 | 157 | 163 |
| **Total** | **274** | **284** | **292** | **277** | **290** | **271** | **289** | **306** | **322** | **337** | **352** | **367** | **382** | **396** | **410** | **425** |

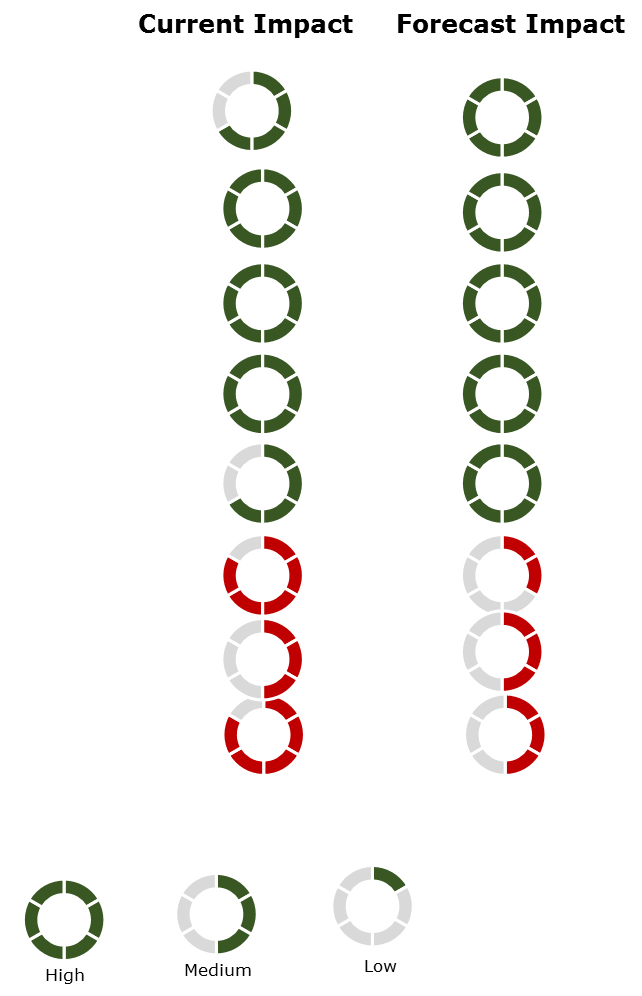
In South America, rising consumption of BPA-based products, increasing demand in the automotive sector, and growing demand in the construction industry tend to catalyse BPA production. South America market for Epoxy resins dominated by liquid & solid, these are widely used as insulation material for electrical and electronics applications, where there is requirement of protection in extreme and dangerous environments (such as chemical plant equipment, deep sea, and engine management). They are used as sealants, coatings, potting compounds, adhesives, mouldings, and impregnates to produce void-free insulation around components.

**3.2.6.7. Sales By Company**

**Figure 62: Middle East & Africa Epoxy Resin Sale s, By Company, By Volume, 2020**

*Source: TechSci Research*

***3.3. MARKET DYNAMICS***

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**Rising investment in building & construction sector**

**Government Support and Initiatives**

**Rising Disposable Income & High Living Standards**

**Focus on renewables**

**Growing usage of specialty resin in automotive, industrial and aerospace sector**

**Fluctuation In Raw Material Prices**

**Overcapacity in some region**

**Supply Chain Disruption**

**Market Drivers**

***Rising Investments in Building & Construction Sector***

With increasing population and continuing economic growth, infrastructure, as well as construction sector spending is rising across the globe. Factors such as significant rise in purchasing power parity, especially in developing nations, and growing investments in the real estate sector are boosting the growth of construction sector, globally. Various government sponsored projects across the globe such as smart cities, AMRUT, freight corridor and urban transport, etc., are expected to provide a huge boost to the construction activities in the coming years in Southeast Asia, GCC, Central Europe and North Africa, thereby positively impacting the global epoxy resin market.

**Table 7: European Countries Real Estate Investment, 2020 (USD Billion)**

|  |  |
| --- | --- |
| **Countries** | **Investment (USD Billion)** |
| Germany | 59 |
| France | 29 |
| Netherland | 16 |
| Spain | 13 |
| Italy | 10 |

*Source: Meed Projects*

***Government Support and Initiatives***

Driven by strong demand from various end-use industries such as wind energy, transportation, electrical and electronics, defense, aerospace, pipes and tanks, construction and marine, the composite industry, also known as fiber-reinforced plastics (FRP) industry, will also be supporting government’s initiatives across various developing countries, hence giving a big push to the market of epoxy resin such as, ‘Make in India’ initiative by the Government of India. In 2021, per capita consumption of composites in the United States and China was reported to be 11.4 kg and 2.8 kg, respectively. Additionally, the per capita consumption in India stood at 0.36 kg. The increasing demand for composites manufacturing across the globe for numerous applications including aerospace structure & other composite parts would spur the demand for Epoxy Resins in the coming years.

***Rising Disposable Income & High Living Standard***

The demand for advanced and premium quality paints & coatings is increasing across the housing and construction sector due to high living standards across developed nations, including improving disposable income across developing countries and driving the epoxy resin market in the forthcoming years. This is further supported by increasing per capita expenses on premium cars across the globe. Moreover, the disposable income level of the middle-class population across various countries is increasing and has significantly augmented the demand for epoxy-based lightweight coatings and adhesives over the years, further driving the market worldwide.

***Market Challenges***

***Volatility in Raw Material Prices***

An increase in the cost of raw materials, i.e., ECH and BPA, that are being used in the manufacturing of the epoxy resin is driving down the market sales in recent years due to several disruptions caused by the COVID-19 outbreak worldwide. Moreover, rising crude oil prices directly impact the operating cost and profit margins of the industry, and higher transportation costs, adding up the price of epoxy resins in the global market. Inflation of raw material costs drives down the demand for these films, which is emerging as one of the major constraints for the overall market growth worldwide.

**Table 8:** **Saudi Arabia Major Ongoing Infrastructure Projects & Expected Year of Completion**

|  |  |
| --- | --- |
| **Name of the Project** | **Expected Completion Year** |
| Sudair City Development | 2029 |
| Jazan Economic City (JEC) | 2036 |
| Prince Abdulaziz Bin Mousaed Economic City | 2025 |
| Waad Al Shamaal Phosphate City Development | 2022 |
| National Railway Network | 2040 |
| Jeddah Public Transportation Program | 2033 |

*Source: World Bank*

**Figure 63: ECH and BPA Prices, 2015-2021E (USD per Tonnes)**

**,**

*Source: TechSci Research*

**3.4. Market Trends & Developments**

***Expansion of Production Facilities***

With the growing demand for Epoxy Resin in various sectors such as automotive, construction, electrical & electronics etc., companies have started investing in expanding and setting up manufacturing facilities across multiple locations worldwide. Moreover, companies are increasingly focusing on investing largely across developing nations due to the availability of cheap labor such as in India, China and others. For instance, Kukdo Chemical Pvt Ltd, one of the leading Korea-based companies, has recently set up greenfield epoxy resin production unit in India with a capacity of around 40 KTPA in 2020 and is further planning to expand its capacity by 60 KTPA by 2024 to address the growing demand across the country and to capture the maximum share in Asian market.

***Growing Demand for Lightweight Material in Automotive and Auto Ancillaries Sectors***

Rising demand for polypropylene and other petrochemical derivatives in the automotive sector is increasing as companies are focusing more on the development of new products and reducing the carbon footprint. Most of the automotive manufacturers are launching hybrid and electric vehicles across the globe. Furthermore, with rising investments in new product development and adopting new technologies, companies are focusing on using more light and composite materials for automotive manufacturing, which is leading to a surge in the demand for petrochemicals and their derivatives.

***Emerging Applications***

Ban on the usage of Bisphenol A has increased the consumption of Epoxy Resin in various applications, such as producing intermediates, high performance polymers, heat sensitive developers, etc. Recently, BPS has substituted BPA-based epoxy resins which are generally used in food packaging containers. Epoxy resins are also used in aerospace plastics as a binder for reinforcements such as glass, carbon or Kevlar. Growing utilization of epoxy resin in epoxy resins is likely to increase its foothold in the market over coming years. Besides, it is anticipated that Epoxy Resin might replace BPA in the polycarbonate production, which may further boost the demand for Epoxy Resins in the coming years.

**Figure 64: Pricing Analysis Epoxy Resin**

*Source: TechSci Research*

Chemical and petrochemical sector is leading to a drop in prices of Epoxy Resins along with various other products. Market fundamentals of Epoxy Resin revived significantly in 2017 following a sharp rebound in market activities. However, in 2018 and 2019, prices fluctuated in a stable to narrow range amidst the uncertainty prevailing from stable feedstock and muted

demand patterns from several downstream industries. In 2020, Epoxy Resin witnessed a marginal dive again due to a ground-breaking fall in crude values and a devastating hit on the global economy in the wake of the COVID-19 outbreak. Despite the second wave of COVID-19 in India, prices showcased an appreciable rebound in 2021 due to consistent demand pattern and spillover effect of high international prices.

**3.6. Customer Analysis**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Product Description** | **Customer / Distributor Name** | **Destination Country** | **Plant Location** | **Supplier Name** | **Shipment Origin** | **Annual Off-take Quantity (Tonnes)** | **Price(USD/KG)** | **Incoterms** |
| 2020 | Liquid | Champion Advanced Materials Pvt Ltd | India | Bangalore | Kuk  do Chemical Co Ltd | South Korea | 237.60 | 2.25 | Delivered at place – tax and duties |
| 2020 | Solid | Fasto Advance Adhesive Technologies | India | Bangalore | Fastfix-It Enterprise Co Ltd | Taiwan | 24.30 | 5.82 | Delivered at place – tax and duties |
| 2020 | Liquid | Huntsman International India Pvt Ltd | India | Mumbai, Bangalore, New Delhi | Huntsman Advanced Materials Europe Bvba | United Kingdom, Germany | 764.25 | 5.95 | Delivered at place – tax and duties |
| 2020 | Solid | Jotun India Private Limited | India | Mumbai | Kukdo Chemical Co Ltd | South Korea | 1237.50 | 2.25 | Delivered at place – tax and duties |
| 2020 | Solid | Jotun India Private Limited | India | Mumbai, Kanchipuram | Kukdo Chemical Co Ltd | South Korea | 967.50 | 3.24 | Delivered at place – tax and duties |
| 2020 | Liquid | Kansai Nerolac Paints Limited | India | Mumbai, Bangalore, New Delhi | Kukdo Chemical Co Ltd, Aditya Birla Chemicals Thailand Ltd. | South Korea, Thailand, Japan | 5093.10 | 3.22 | Delivered at place – tax and duties |
| 2020 | Solid | Kansai Nerolac Paints Limited | India | Mumbai, Bangalore, New Delhi | Kukdo Chemical Co Ltd, Aditya Birla Chemicals Thailand Ltd. | South Korea, Thailand, Japan | 5008.95 | 2.50 | Delivered at place – tax and duties |
| 2020 | Solid | Napino Auto Electronics Ltd | India | Mumbai, New Delhi | Shindengen Electric Manufacturing | Japan | 856.80 | 4.81 | Delivered at place – tax and duties |
| 2020 | Liquid | Ppg Asian Paints Private Limited | India | Mumbai, Bangalore, New Delhi, Chennai | Ppg Industries Korea Ltd, Kumho P & G Chemicals Ltd. | South Korea | 6231.75 | 1.62 | Delivered at place – tax and duties |
| 2020 | Liquid | Precision Electronic Component Mfg Co | India | Mumbai | Synresalmoco Bv | Netherlands | 27.00 | 9.50 | Delivered at place – tax and duties |
| 2020 | Liquid | Siegwerk India Private Limited | India | Mumbai, Bangalore, New Delhi | Qualipoly Chemical Corporation, Eternal Materials Co., Ltd. | Taiwan | 1176.00 | 3.15 | Delivered at place – tax and duties |
| 2020 | Solid | Stonera Systems Pvt Ltd | India | Mumbai, Bangalore, New Delhi | Isep Srl | Italy | 608.55 | 4.05 | Delivered at place – tax and duties |
| 2020 | Liquid | Vimal Intertrade Pvt Ltd | India | Mumbai | Evonik Ressource Efficiency Gm | Germany | 588.00 | 8.24 | Delivered at place – tax and duties |
| 2020 | Liquid | Yamaha Motor Electronics India Private Limited | India | Mumbai, Bangalore | Yamaha Motor Electronics Taiwan Co., Towa Denki Trading (S) Pte Ltd | Taiwan, Singapore | 227.46 | 24.13 | Delivered at place – tax and duties |
| 2020 | Liquid | Pt. Sika Indonesia | Indonesia | Bekasi, West Java | Aditya Birla ChemicalsLtd., Nan Ya Plastics Corporation | Thailand, Taiwan | 1366.26 | 4.99 | Delivered at place – tax and duties |
| 2020 | Liquid | Pt. Nipsea Paint And Chemicals | Indonesia | Jakarta | Aditya Birla Chemicals(Thailand)Ltd., Nan Ya Plastics Corporation | Thailand, Taiwan | 2163.02 | 2.71 | Delivered at place – tax and duties |
| 2020 | Liquid | Pt. Panasonic Industrial Devices Batam | Indonesia | Jakarta | Panasonic Industrial Devices Singapore | Singapore, Thailand | 989.94 | 12.37 | Delivered at place – tax and duties |
| 2020 | Liquid | Pt. Propan Raya Industrial Coating Chemicals | Indonesia | Tangerang, Banten | Aditya Birla Chemicals (Thailand) Ltd. | Thailand | 816.00 | 4.08 | Delivered at place – tax and duties |
| 2020 | Liquid | Pt. Hempel Indonesia | Indonesia | Jawa Barat | Chang Chun Plastics Co.,Ltd | Taiwan | 1056.00 | 4.35 | Delivered at place – tax and duties |
| 2020 | Liquid | Berger Paints Pakistan Limited. | Pakistan | Karachi | Hls Technology Development | China | 208.80 | 3.14 | Delivered at place – tax and duties |
| 2020 | Liquid | Awan Sports Industries (Pvt) Ltd | Pakistan | Sialkot | Kukdo Chemical Co.Ltd. | South Korea | 184.80 | 4.20 | Delivered at place – tax and duties |
| 2020 | Liquid | Famsa Polymers Industry Private Limited | Pakistan | Karachi | Jubail Chemical Industries Co. (Jana)., | Saudi Arabia | 92.88 | 2.12 | Delivered at place – tax and duties |

*Source: TechSci Research*

**Table 9: Global Epoxy Resin Trade Dynamics – Import (Thousand Tonnes), 2018-2020**

**3.7. Global Epoxy Resin Foreign Trade Analysis, 2018-2020**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Country** | **2018** | | **2019** | | **2020** | |
| **Import** | **Value** | **Volume** | **Value** | **Volume** | **Value** | **Volume** |
| China | 776.66 | 235.42 | 995.15 | 288.77 | 1255.09 | 404.81 |
| Germany | 550.57 | 169.86 | 570.11 | 155.49 | 491.00 | 142.12 |
| United States | 318.08 | 94.97 | 451.16 | 108.62 | 351.99 | 88.55 |
| Italy | 166.56 | 70.50 | 190.60 | 64.02 | 164.31 | 58.16 |
| Turkey | 107.77 | 44.33 | 168.58 | 56.39 | 154.10 | 52.96 |
| Netherlands | 100.26 | 41.98 | 134.65 | 42.40 | 157.70 | 45.77 |
| Russia | 109.71 | 38.84 | 151.31 | 47.90 | 145.13 | 45.74 |
| United Kingdom | 201.33 | 55.63 | 214.34 | 55.56 | 155.62 | 45.43 |
| Japan | 137.89 | 48.41 | 169.31 | 50.05 | 149.23 | 44.35 |
| India | 153.81 | 57.77 | 170.82 | 55.05 | 132.67 | 44.20 |
| Others | 333.35 | 125.33 | 510.46 | 219.76 | 390.56 | 136.69 |
| **Total** | **2955.98** | **983.04** | **3726.49** | **1143.98** | **3547.41** | **1108.77** |

*Source: TechSci Research*

**Table 10: Global Epoxy Resin Trade Dynamics – Export (Thousand Tonnes), 2018-2020**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Country** | **2018** | | **2019** | | **2020** | |
| **Export** | **Value** | **Volume** | **Value** | **Volume** | **Value** | **Volume** |
| **South Korea** | 531.18 | 174.35 | 515.11 | 192.77 | 508.36 | 206.53 |
| **Germany** | 709.79 | 170.67 | 646.04 | 161.96 | 599.19 | 161.67 |
| **Taiwan** | 406.23 | 131.75 | 395.48 | 145.36 | 408.98 | 153.53 |
| **USA** | 414.40 | 95.21 | 445.60 | 123.36 | 413.17 | 105.89 |
| **Netherlands** | 225.08 | 79.40 | 210.66 | 79.99 | 210.31 | 74.36 |
| **Thailand** | 110.80 | 34.13 | 105.40 | 35.19 | 104.84 | 38.01 |
| **Czech Republic** | 96.63 | 32.77 | 86.29 | 33.90 | 79.73 | 34.00 |
| **China** | 108.68 | 34.66 | 83.56 | 28.88 | 78.38 | 28.31 |
| **Switzerland** | 207.28 | 37.91 | 178.97 | 33.56 | 133.35 | 26.45 |
| **Japan** | 300.07 | 29.64 | 288.44 | 26.68 | 298.14 | 24.84 |
| **Others** | 667.44 | 263.15 | 612.34 | 282.33 | 640.37 | 255.17 |
| **Total** | **3777.59** | **1083.63** | **3567.88** | **1143.98** | **3474.82** | **1108.77** |

*Source: TechSci Research*

**3.8. Global Demand-Supply Gap**

**Demand Supply Scenario**

The overall market for Epoxy Resin is currently in a surplus situation in the APAC region because downstream manufacturers are still consuming epoxy. Manufacturers from the APAC region are focusing on the export market due to the gradual replacement of conventional polymers with Epoxy Resin in European countries. However, companies are currently operating at lower rates due to uncertainty in demand potential owing to the current pandemic situation. However, estimated demand-supply gap in the APAC region till 2025 may generate the need for capacity addition or running plants at 100% capacities to overcome the supply gap.

Major demand for Epoxy Resin in Europe is derived from construction and automobiles production. Major producers such as Olin Corporation produce and consume Epoxy Resin in various types and forms. Due to various health hazards possessed by Bisphenol, environmental regulators in Europe are gradually imposing a ban on the consumption of raw material, Bisphenol A. BPA is on the EU’s candidate list for its reprotoxic and endocrine-disrupting properties and was subject to an EU ban in 2016, effective from 2020.

Consequently, Epoxy Resin has increasingly been used by paints & coatings manufacturers across Europe as an alternative to other compounds. Thus, demand for Epoxy Resin has recently taken an exponential pace in the European market. However, on the supply side, the European market is still dependent on the Asia-Pacific region for Epoxy Resin. It is estimated that in 2020, half of the demand for Epoxy Resin from Europe will be catered through imports.

In North America, Epoxy Resin has been listed as an indirect additive to be used as a monomer in the production of paints and other construction coatings. In 2020, many players, including market player, Hexion Inc. revamped their total production significantly in the United States during year-end. In 2019, demand for Bisphenol increased by more than half of what it was in 2018, thereby leaving the supply more on the shortage side and mostly dependent on imports from APAC countries for raw material.

**2**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **2015** | **2016** | **2017** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **Global** | **Capacity** | 3765.50 | 3795.50 | 4048.00 | 4419.00 | 4484.00 | 4519.00 | 4648.00 | 4648.00 |
| **Production** | 2866.28 | 2986.35 | 3150.56 | 3470.41 | 3246.33 | 3485.36 | 3723.96 | 4119.41 |
| **Total Demand** | 2753.56 | 2891.29 | 3110.44 | 3364.65 | 3261.08 | 3493.88 | 4399.71 | 5511.29 |
| **Demand Supply Gap** | 112.72 | 95.06 | 40.12 | 105.76 | -14.75 | -8.52 | -675.75 | -1391.88 |

*Source: TechSci Research*

**Global – Demand-Supply Gap**

The global market share for epoxy resins exhibited a gradual increase over the historical years. The market is driven by increasing demand of epoxy resins in various applications such as coatings, adhesives, and composites. Onset of COVID19, led to the slowdown of automotive and construction sectors in 2020 causing small backlog in the global epoxy resin demand that stood at 3261 KT. The quarter two of 2021 was also affected by supply chain disruptions owing to the emergence of fresh cases. However, the market is currently in its revival stage with resumed construction and other end-user industrial operations, which is expected to increase the global consumption to 3494 KT. The demand for epoxy resin is expected to register a healthy CAGR of 5.45% in the forecasted period of 2021-2030.

**Table 13: Asia-Pacific Epoxy Resin Market Supply Analysis, By Volume, 2015-2025F (Thousand Tonnes)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **Asia-Pacific** | **Capacity** | 2334.50 | 2364.50 | 2607.00 | 2701.00 | 2816.00 | 2856.00 | 2891.00 | 3020.00 | 3020.00 |
| **Production** | 1819.25 | 1907.96 | 2061.97 | 2142.26 | 2261.90 | 2134.82 | 2302.76 | 2444.92 | 2711.85 |
| **Import** | 382.51 | 417.21 | 463.63 | 446.25 | 473.95 | 555.57 | 0.00 | 0.00 | 0.00 |
| **Export** | 607.31 | 642.17 | 661.85 | 664.97 | 682.87 | 650.32 | 0.00 | 0.00 | 0.00 |
| **Total Demand** | 1594.46 | 1683.00 | 1863.75 | 1923.53 | 2052.97 | 2040.07 | 2200.42 | 2870.45 | 3674.98 |
| **Demand Supply Gap** | 181.94 | 221.36 | 261.06 | 246.42 | 265.47 | 156.34 | 269.98 | -409.59 | -1114.78 |

*Source: TechSci Research*

**Table 14: Europe Epoxy Resin Market Supply Analysis, By Volume, 2015-2025F (Thousand Tonnes)**

*Source: TechSci Research*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **2015** | **2016** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **Europe** | **Capacity** | 741.00 | 741.00 | 913.00 | 938.00 | 938.00 | 938.00 | 938.00 |
| **Production** | 525.52 | 541.75 | 695.91 | 621.05 | 676.78 | 741.02 | 812.20 |
| **Import** | 250.00 | 270.00 | 225.31 | 210.04 | 0.00 | 0.00 | 0.00 |
| **Export** | 260.10 | 272.55 | 310.40 | 270.44 | 0.00 | 0.00 | 0.00 |
| **Total Demand** | 506.79 | 530.31 | 599.38 | 550.56 | **582.00** | **675.07** | **821.76** |
| **Demand Supply Gap** | 18.73 | 11.44 | 96.53 | 70.49 | 94.78 | 65.95 | -9.56 |

**Europe – Demand Supply Gap**

European region exhibited a total demand of 550 KT epoxy resin in 2020 after experiencing a drop of 8.14% from the previous year owing to the COVID19 pandemic. In the historical years, the demand for epoxy resin grew at a slow pace due to the struggling European paint industry post soaring epoxy resin prices backed by feedstock shortage in the region. The demand in the European region is expected to increase in the forecast years with total consumption 822 thousand tonnes in 2030. The projected CAGR will remain approximately 4% between the years 2021-2030.

**Table 15: North America Epoxy Resin Market Supply Analysis, By Volume, 2015-2025F (Thousand Tonnes)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **2015** | **2016** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **North America** | **Capacity** | 427.00 | 427.00 | 427.00 | 427.00 | 427.00 | 427.00 | 427.00 |
| **Production** | 321.43 | 325.37 | 320.18 | 287.36 | 299.04 | 319.86 | 356.56 |
| **Import** | 85.90 | 95.91 | 135.71 | 121.91 | 0.00 | 0.00 | 0.00 |
| **Export** | 102.04 | 105.91 | 112.89 | 86.94 | 0.00 | 0.00 | 0.00 |
| **Total Demand** | 298.86 | 308.86 | 336.60 | 316.58 | 334.66 | 397.04 | 465.26 |
| **Demand Supply Gap** | 22.57 | 16.51 | -16.42 | -29.22 | -35.62 | -77.18 | -108.70 |

*Source: TechSci Research*

**North America – Demand Supply Gap**

Total Consumption of epoxy resin in North America region is 316 KTA in the year 2020 against production of 287 KTA. In Past, major construction work & expansion in electrical and electronic region has been observed. Also this region is known for its technological development & innovation, which motivates manufacturer to make the high quality resin with wide range of properties. The major factor driving the market is current & emerging application in Electrical & electronics sector, superior & modern structure of construction infrastructure. A decrease trend in demand has been observed in year 2020 due to Covid 19 pandemic by 5.71% from the previous year, but as situation is getting normalized, market will soon recover with the optimal growth rate of 4 % in forecasted period 2021-2030

**Table 16: South America Epoxy Resin Market Supply Analysis, By Volume, 2015-2025F (Thousand Tonnes)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **South America** | **Capacity** | 43.00 | 43.00 | 43.00 | 43.00 | 43.00 | 43.00 | 43.00 | 43.00 | 43.00 |
| **Production** | 33.50 | 35.82 | 35.15 | 34.46 | 33.22 | 31.75 | 32.97 | 34.56 | 38.20 |
| **Import** | 52.11 | 55.11 | 52.56 | 57.11 | 56.34 | 54.23 | 0.00 | 0.00 | 0.00 |
| **Export** | 6.03 | 6.23 | 5.67 | 5.41 | 4.23 | 3.11 | 0.00 | 0.00 | 0.00 |
| **Total Demand** | 79.58 | 84.70 | 82.04 | 86.16 | 85.33 | 82.87 | 87.60 | 104.66 | 123.99 |
| **Demand Supply Gap** | -46.08 | -48.88 | -46.89 | -51.70 | -52.11 | -51.12 | -54.63 | -70.10 | -85.79 |

*Source: TechSci Research*

**South America – Demand Supply Gap**

South America has the lowest demand for epoxy region out of the global market share. The total consumption of epoxy resin in MEA region remained 83 thousand tonnes after registering a depreciation of 2.8% from the previous year. The region has very few production units, hence, the annual demand is fulfilled by heavy imports of epoxy resin. The region will be seeing a substantial growth in its demand by 2030 where the consumption volume is estimated to be around 4%. The increasing manufacturing sectors and industrialization in the region will remain the driving force behind the anticipated growth.

**Table 17: MEA Epoxy Resin Market Supply Analysis, By Volume, 2015-2025F (Thousand Tonnes)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2015** | **2016** | **2017** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **Capacity** | 74.00 | 84.00 | 84.00 | 106.00 | 146.00 | 146.00 | 265.00 | 265.00 |
| **Production** | 46.76 | 55.66 | 68.57 | 86.61 | 78.00 | 103.50 | 213.00 | 232.25 |
| **Import** | 39.67 | 42.06 | 37.47 | 32.05 | 29.81 | 27.52 |  |  |
| **Export** | 22.40 | 26.37 | 28.20 | 25.47 | 19.32 | 32.55 |  |  |
| **Total Demand** | 64.03 | 71.35 | 77.84 | 93.19 | 88.49 | 98.47 | 134.00 | 188.59 |
| **Demand Supply Gap** | -107.29 | -108.96 | -119.67 | -131.18 | -99.65 | -115.39 | -168.89 | -224.71 |

*Source: TechSci Research*

**MEA – Demand Supply Gap:**

The demand for Epoxy Resin in MEA has showed increased trend from past few years and estimated to be nearly 178 thousand tonnes in 2022 against capacity 220 thousand tonnes. which is further anticipated to grow during the forecast period 2021-2030 by 4.62%. The increase in demand is attributed to the rising demand for composites manufacturing in the region for the number of applications including aerospace structure & other composite parts would spur the demand for Epoxy Resins in MEA. companies profiled at Middle eastern area are include 3M, Aditya Birla Chemicals, BASF SE, Daicel Corporation, DuPont, Hexion, Huntsman Corporation, NAMA Chemicals, NAN YA Plastics, and Olin Corporation

**Table 18: India Epoxy Resin Market Supply Analysis, By Volume, 2015-2025F (Thousand Tonnes)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021E** | **2025F** | **2030F** |
| **India** | **Capacity** | 74.00 | 84.00 | 84.00 | 106.00 | 106.00 | 146.00 | 146.00 | 265.00 | 265.00 |
| **Production** | 46.76 | 55.66 | 68.57 | 88.64 | 86.61 | 78.00 | 103.50 | 213.00 | 232.25 |
| **Import** | 39.67 | 42.06 | 37.47 | 26.37 | 32.05 | 29.81 | 27.52 |  |  |
| **Export** | 22.40 | 26.37 | 28.20 | 29.66 | 25.47 | 19.32 | 32.55 |  |  |
| **Total Demand** | 64.03 | 71.35 | 77.84 | 85.35 | 93.19 | 88.49 | 98.47 | 134.00 | 188.59 |
| **Demand Supply Gap** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.03 | 79.00 | 43.66 |

**India – Demand-Supply Gap**

The epoxy resin market share in India grew at a steady pace in the years 2015-2019. The market suffered some setback in 2020 due to the COVID19 spread and lockdown constraints that caused halts in operations and decreased construction activities and limited use of automobile. The demand of epoxy resin in India is expected to increase due to rise in demand from the end-user industries such as in powder coating applications, floorings and in building and construction sector. The paints and coatings sector will be the major driver for the surging epoxy resin demand backed by the improving economy and rising living standard of the Indian population. The total domestic demand in 2030 is projected to rise to 188.6 KT with a CAGR of 7.5%.

**3.9. Value Chain Analysis**

**Value Chain Analysis:**

The epoxy resin has been synthesized by the Bulk polymerization by the continuous process of polymerization. The material available commercially at 98% purity & colourless mobile liquid. Many commercial liquid resins consist essentially of low molecular weight diglycidyl ether of Bis-phenol A together with small quantity of higher molecular weight polymer. During the reaction hydrochloric acid has release. HCl has reacted with caustic & salt has form. The molar ratio of the BPA to ECH is 1:2 i.e. 1 mole of BPA & 2 mole of ECH. It is responsible to produce higher mol. wt. resin but in actual practice this ratio is 2-3 times more i.e. up to 1:5 or 1:6 of BPA to ECH.

**Sourcing: Raw Ingredients/Materials:** Domestic sources Depends mainly on local availability of the required raw materials for business strategy, financial capabilities and the preferences of each company, raw materials are sourced locally in part or in whole. For example, a domestic player specialising in manufacturing Epoxy resin for private label declared that raw materials are always sourced locally, when possible, to maintain competitive costs, given their low price compared to imports. Generally, imported raw materials become an option only when the required ingredients are not locally available or do not match the needed quality (some active ingredients such as Hardeners, fillers, BPA & ECH, Catalyst). Meanwhile, another manufacturer that owns its own private brand may state that all raw materials used are imported due to quality concerns.

**Imported sources** Most manufacturers in India or Globally depends partially on import for at least a portion of their raw materials, according to their specific needs. For example, some producers source BPA from Saudi Arabia, Catalyst, Hardener or filler from USA, China or Europe, and other active ingredients from China. Interviewed representatives from companies noted that they prefer to import directly from foreign suppliers to keep costs down, however, when this is not possible an import agent is used. Every larger manufacturer/players gets engaged in vertical backwards integration to source at least a portion of their raw materials (certain active ingredients like Acetone, phenol and propylene required for BPA & ECH) from their own production. This allows them to have greater control over the price and quality of inputs used in their production process, while also eliminating risks related to availability/timeliness of delivery of raw materials, and, in the case of imported products, additional risks deriving from exchange rate fluctuations, negotiations with foreign suppliers/import agents, and potential bureaucratic delays when importing raw materials. It is reported that there is large potential for development at the inputs stage of the value chain if the right support is obtained. For example, some active ingredients, enhancers and enzymes used as raw materials by companies are not available locally and have to be imported, but these could potentially be produced by domestic chemical manufacturers provided financial and technical support is offered for the manufacturing of speciality chemicals (like from refineries in this case). This would back the development of both the domestic Epoxy sector subsector (which would have local access to currently imported raw materials at lower costs) and the broader Chemical industry (through the manufacturing of higher-value-added products and expansion of output).

**Challenges at the Input Stage** For imported raw materials, most players are subject to potential customs delays due to what they deem the inconsistent application of import regulations by Customs authorities

Lack of availability of some raw materials ( certain key ingredients such as Catalyst, Hardeners, BPA, ECH, enhancers, and enzymes) in the domestic market forces producers to import these inputs at higher costs.

The small size of most domestic epoxy resin manufacturers reduces their options to establish direct business relations with foreign suppliers, prompting them to use the services of import agents with a subsequent impact on profit margins.

**Distribution and Marketing**

**Local Market:** Epoxy Resin in the Indian market are mainly distributed through retailers scattered across the country & through Direct company sale with ratio 44 to 56. The expansion of modern retail channels favours the entrance of global brands from international Epoxy resin producers, which generally focus their distribution on modern retailers that can handle their volumes and partner with them in their marketing campaigns. Retailers usually take charge of shipping and delivery from manufacturers (at an incremental cost of 5-10% over), although some manufacturers (particularly the largest ones) have their own fleets and personnel for delivery services, which they provide to retailers as a value add.

**Challenges in the Distribution and Marketing Stage**: Challenges posed by the “parallel trade” make it difficult for retailers to honour their exclusive distribution agreements with foreign brands.

Lack of highly skilled marketing personnel further reduces local products’ competitive position against imported products, and in international markets. Opportunities in the Distribution and Marketing Stage

**Value Chain Flow for Captive Liquid Epoxy Resin Manufacturer**

**BPA:** Phenol (1.08 USD ) & Acetone (0.54 USD) (Mole Ration 2:1)) 1.77 **USD)**

**Paints and Coatings (40-46%)**

**Adhesive & sealant (20-25%)**

**Electronics And Electrical (6-8%)**

**Manufacturer**

**Percentage Margin 26 %**

**Including Transportation charges**

Current Selling Price (3.09 **USD**) Direct Sales

Overhead Cost (**0.86$**)

**Direct Sales**

**Percentage Margin 29 %**

**Company Website/Direct Export/Direct Sales**

**ECH**: Propylene (1.13USD), Chlorine Gas () & Lime (Mole Ration 2:2:1)) (**1.56 USD)**

Packaging Cost (**0.26 $)**

Raw Material Cost (**1.27 $)**

**Caustic Lye (48%) (0.16$)**

Total Cost Incurred (**2.39 USD**)

Current Selling Price ( **3.01 USD)** In-Direct Sales (Inclusive Freight Charges)

**In-Direct Sales**

**Epoxy Resin Value Chain**

**Distributor/Retailer**

**Others (19-21%)**

**Value Chain Flow for Captive Solid Epoxy Resin Manufacturer**

Epoxy Resin (2.39 USD)

**Epoxy Resin Value Chain**

**Manufacturer**

**Percentage Margin 22.34%**

**Including Transportation charges**

Current Selling Price (3.49 USD) In-Direct Sales

Current Selling Price (3.57 USD) Direct Sales

Overhead Cost (0.80USD)

Raw Material Cost (1.65 USD)

Bisphenol-A(1.77 USD)

Xylene (0.55 USD)

**In-Direct Sales**

**Direct Sales**

**Percentage Margin 24.01%**

**Company Website/Direct Export/Direct Sales**

Packaging Cost (0.26 USD)

Catalyst (57.57 USD) (Recoverable)

Total Cost Incurred (2.77USD)

**Distributor/Retailer**

**Adhesive & sealant (20-25%)**

**Electronics And Electrical (6-8%)**

**(16-18%)**

**Paints and Coatings (40-46%)**

**Others (19-21%)**

**Value Chain Flow for Non Captive Liquid Epoxy Resin Manufacturer**

**BPA:** 2.31 **USD**

**Paints and Coatings (40-46%)**

**Adhesive & sealant (20-25%)**

**Electronics And Electrical (6-8%)**

**Manufacturer**

**Percentage Margin 10.5%**

**Including Transportation charges**

Current Selling Price 3.09 **USD** Direct Sales

Overhead Cost (**0.86$**)

**Percentage Margin 12.36 %**

**Company Website/Direct Export/Direct Sales**

Packaging Cost (**0.26 $)**

Raw Material Cost (**1.63 $)**

**ECH**: **2.04 USD**

**Caustic Lye (48%) 0.21$**

Total Cost Incurred (**2.75 USD**)

**Direct Sales**

Current Selling Price **3.03 USD** In-Direct Sales (Inclusive Freight Charges)

**In-Direct Sales**

**Epoxy Resin Value Chain**

**Distributor/Retailer**

**Others (19-21%)**

****



**Value Chain Flow for Non Captive Solid Epoxy Resin Manufacturer**

Epoxy: 3.09 USD)

**Epoxy Resin Value Chain**

**Manufacturer**

**Percentage Margin 8.3 %**

**Including Transportation charges**

Current Selling Price (3.49 USD) In-Direct Sales

Current Selling Price (3.57 USD) Direct Sales

Overhead Cost (0.80USD)

Raw Material Cost (2.14 USD)

Xylene (0.68 USD)

**In-Direct Sales**

**Direct Sales**

**Percentage Margin 10.17%**

**Company Website/Direct Export/Direct Sales**

Bisphenol-A(2.31 USD)

Packaging Cost (0.26) USD)

Catalyst (57.57 USD) (Recoverable)

Total Cost Incurred (3.2 USD)

**Distributor/Retailer**

**Adhesive & sealant (20-25%)**

**Electronics And Electrical (6-8%)**

**(16-18%)**

**Paints and Coatings (40-46%)**

**Others (19-21%)**

**Table 19: Channel Partner:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Raw Material | Supplier 1 | Supplier 2 | Supplier 3 | Supplier 4 | Supplier 5 |
| Phenol | Deepak Phenolics | HOCL | INEOS | Sasol |  |
| Acetone | Hindustan Organic Chemicals Ltd. | Deepak Phenolics Ltd | Kumho P & B Chemicals | Solvay | SABIC |
| Propylene | Manali Petrochemical | Dow | BASF SE | INEOS | Sumitomo Chemical Co. Ltd. |
| NAOH | Tata Chemicals Ltd. | Gujarat Alkalies and Chemicals Limited | Solvay Chemicals | Aditya Birla Chemicals (India) Limited | Dow |
| Cl2 Gas | Tata Chemicals Ltd. | Gujarat Alkali and Chemicals Limited | Hanwha Chemical Corporation | Occidental Petroleum Corporation | PPG Industries |
| BPA | Atul Ltd. | Dow Chemical | LG Chem | Mitsubishi Chemical | Mitsui Chemicals |
| ECH | Dow Chemical | Solvay SA | Momentive Performance Materials Inc. | Solvay Chemicals | NAMA Chemicals |
| Toluene | Reliance Industries | Indian Oil Corporation Limited | Exxon Mobil Corporation | Covestro AG | BASF |
| Lime | Innova Corporate | United States Lime & Minerals, Inc | Graymont Limited | Hydrite Chemical Co. |  |

**Annexure: Global Epoxy Resin Demand, By Volume, 2020-2030F (Thousand Tonnes)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand Scenario** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Pessimistic | 3261.08 | 3395.4 | 3511.6 | 3613.5 | 3718.2 | 3808.6 | 3880.6 | 3947.4 | 4008.4 | 4065.9 | 4120.8 |
| Realistic | 3261.08 | 3493.88 | 3718.96 | 3939.22 | 4172.31 | 4399.71 | 4615.84 | 4834.62 | 5055.41 | 5280.54 | 5511.29 |
| Optimistic | 3261.08 | 3575.7 | 3895.8 | 4224.4 | 4580.3 | 4945.0 | 5312.0 | 5697.1 | 6100.3 | 6525.0 | 6974.0 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand Scenario** | **2020** | **2021E** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| Pessimistic | 96.25 | 101.92 | 107.64 | 113.39 | 119.22 | 125.05 | 130.92 | 136.86 | 142.84 | 149.03 | 96.25 |
| Realistic | 88.49 | 98.47 | 106.74 | 115.41 | 124.48 | 134.00 | 143.92 | 154.28 | 165.16 | 176.52 | 188.59 |
| Optimistic | 9.53 | 102.04 | 117.65 | 132.28 | 148.35 | 165.99 | 185.37 | 206.56 | 229.76 | 255.22 | 283.06 |