

Industry Research Report
on
Industrial Laminates Manufacturing
Industry

July 2025

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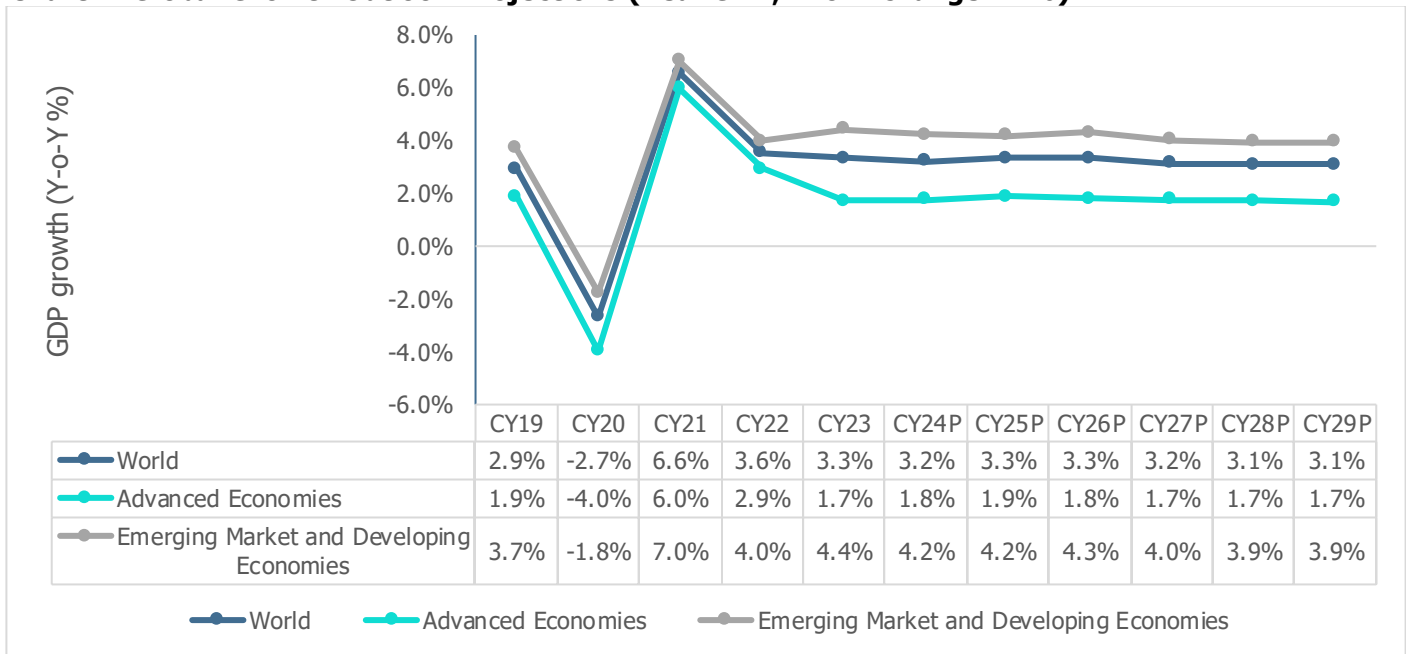
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1 Economic Outlook

1.1 Global Economy

Global growth, which reached 3.3% in CY23, is projected to stabilize at 3.2% for CY24 and 3.3% for CY25. The outlook for global real GDP growth indicates potential improvement as cyclical imbalances ease, bringing economic activity in major economies closer to their potential output. While global disinflation progresses, risks remain, particularly from financial market volatility and geopolitical tensions that could disrupt trade and increase commodity prices. Nonetheless, stronger public investment in advanced economies aimed at infrastructure and the green transition may stimulate private sector investment and bolster global demand. Additionally, accelerating structural reforms in both advanced and emerging markets could enhance productivity and support medium-term growth.

Chart 1: Global Growth Outlook Projections (Real GDP, Y-o-Y change in %)



Notes: P-Projection; Source: IMF – World Economic Outlook, January 2025

Table 1: GDP growth trend comparison - India v/s Other Economies (Real GDP, Y-o-Y change in %)

| | Real GDP (Y-o-Y change in %) | | | | | | | | | |
|---------------|------------------------------|------|------|------|-------|-------|-------|-------|-------|-------|
| | CY20 | CY21 | CY22 | CY23 | CY24P | CY25P | CY26P | CY27P | CY28P | CY29P |
| India | -5.8 | 9.7 | 7.0 | 8.2 | 7.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| China | 2.2 | 8.4 | 3.0 | 5.3 | 4.8 | 4.5 | 4.1 | 3.6 | 3.4 | 3.3 |
| Indonesia | -2.1 | 3.7 | 5.3 | 5.0 | 5.0 | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 |
| Saudi Arabia | -3.6 | 5.1 | 7.5 | -0.8 | 1.5 | 4.6 | 4.4 | 3.6 | 3.5 | 3.5 |
| Brazil | -3.3 | 4.8 | 3.0 | 2.9 | 3.0 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 |
| Euro Area | -6.1 | 6.2 | 3.3 | 0.4 | 0.8 | 1.2 | 1.5 | 1.4 | 1.3 | 1.2 |
| United States | -2.2 | 6.1 | 2.5 | 2.9 | 2.8 | 2.2 | 2.0 | 2.1 | 2.1 | 2.1 |
| Middle East | -2.2 | 4.4 | 5.5 | 2.1 | 2.4 | 3.9 | 4.2 | 3.9 | 3.8 | 3.8 |

| | Real GDP (Y-o-Y change in %) | | | | | | | | | |
|---------------|------------------------------|------|------|------|-------|-------|-------|-------|-------|-------|
| | CY20 | CY21 | CY22 | CY23 | CY24P | CY25P | CY26P | CY27P | CY28P | CY29P |
| Latin America | -6.9 | 7.4 | 4.2 | 2.2 | 2.1 | 2.5 | 2.7 | 2.8 | 2.7 | 2.6 |

P- Projections; Source: IMF- World Economic Outlook Database (January 2025)

Note: CY20-CY26 data is taken from January 2025 IMF WEO report, while CY27-CY29 data is taken from October 2024 database, as this update is yet to come.

1.1.1 Advanced Economies Group

Advanced economies are expected to experience a gradual increase in growth, increasing to 1.8% in CY24 and staying same for next 2 years.

The **United States** is expected to grow to 2.8% in CY24, followed by a slight slowdown to 2.7% in CY25. Growth outlook for the United States has improved due to strong consumption and non-residential investment, driven by rising real wages and wealth effects. However, growth is expected to decelerate as fiscal policies tighten and the labour market cools, leading to a gradual closure of the output gap.

The **Euro Area's** growth is anticipated to rebound from its sluggish growth in CY24 to 0.8% in CY24 and further to 1.0% in CY25. This recovery is driven by better export performance, as well as, a stronger domestic demand. The gradual loosening of the monetary policy is expected to boost investment and the rise of real wages is anticipated to improve the consumption patterns.

1.1.2 Emerging Market and Developing Economies Group

Emerging market and developing economies are forecasted to maintain stable growth at 4.2% in both CY24 and CY25. The economic forecast for emerging and developing Asia reveals a modest deceleration in growth, with projections indicating a decline from 5.3% in CY24 to 5% in CY25. **China's** trajectory reflects a gradual slowdown, transitioning from 4.8% in CY24 to 4.5% in CY26 due to low consumer confidence and ongoing real estate sector challenges. However, better than expected net exports have ensured that the slowdown in growth is marginal. In contrast, **India's** growth remains robust, with anticipated rates of 7% in CY24 and 6.5% in CY25. This moderation in GDP growth is expected as the surge in pent-up demand from the pandemic wanes. The economy is transitioning towards its potential, reflecting a more sustainable pace of growth as it adjusts to post-pandemic realities.

The **Indonesian** economy is expected to register growth of 5.0% in CY24 and 5.1% in CY25, an important concern for Indonesia is the trade fragmentation. **Saudi Arabia's** growth in CY24 is predicted to see a revamp in the growth rate to 1.5% on account of the extension of oil production cuts taking place in the country. Going forward, GDP is expected to grow at 3.3% in CY25. On the other hand, **Brazil's** growth is projected to be 3% in CY24 due to robust private consumption and investment driven by a strong labour market and effective government transfers. However, due to the anticipated tightening of the labour market and ongoing restrictive monetary policy, growth is expected to slowdown in CY25 to 2.2%.

Despite the turmoil in the last 2-3 years, India bears good tidings to become a USD 5 trillion economy by CY27. According to the IMF dataset on Gross Domestic Product (GDP) at current prices, the nominal GDP has been at USD 3.6 trillion for CY23 and is projected to reach USD 5.2 trillion by CY27 and USD 6.3 trillion by CY29. India's expected GDP growth rate for coming years is almost double compared to the world economy. The Indian economy shows resilience amid global

inflation, supported by a stable financial sector, strong service exports, and robust investment driven by government spending and high-income consumer consumption, positioning it for better growth than other economies.

Growth in the **Middle East** and Central Asia is projected to increase, but at a slower pace than initially expected in October. This revision primarily reflects a 1.3 percentage point reduction in Saudi Arabia's CY25 growth forecast, mainly due to the extension of OPEC+ production cuts. In **Latin America** and the Caribbean, growth is expected to slightly accelerate to 2.5 percent in CY25, despite a slowdown in the region's largest economies. Meanwhile, growth in sub-Saharan Africa is forecast to rise in CY25, whereas emerging and developing Europe is anticipated to experience a slowdown.

1.1.3 Shift in manufacturing preferences from China to other countries

The shift in manufacturing preferences from China to other countries is fuelled by various factors, including increasing labour costs in China, disruptions in global supply chains (exacerbated by the COVID-19 pandemic), geopolitical tensions, and a growing need for diversification in sourcing. As businesses strive to reduce their reliance on China and mitigate risks, several nations are emerging as prominent beneficiaries of this transition.

Notable beneficiaries include:

- India, with its large and young labour force, has become an increasingly attractive destination for foreign investment. The country's expanding infrastructure and government initiatives such as Make in India aim to boost domestic manufacturing capabilities. This, combined with India's growing role in sectors like electronics, textiles, and automobiles, makes it an appealing alternative to China for global companies seeking to diversify their supply chains. India's focus on innovation, ease of doing business reforms, and favourable trade policies further support its rise as a manufacturing hub.
- Vietnam's appeal is rooted in its competitive labour costs and strong trade agreements, such as its membership in the CPTPP and the EU-Vietnam Free Trade Agreement. These factors, coupled with rapid industrialization, have made Vietnam a preferred destination for manufacturing, particularly in sectors like electronics, textiles, and consumer goods. Vietnam's investment in infrastructure, such as ports and logistics, has also enhanced its capacity to become a key player in global supply chains.
- Thailand, known for its well-established manufacturing sector, continues to benefit from its expertise in industries such as automotive and electronics. The country's strong export market, skilled labour force, and government support for manufacturing industries further position Thailand as an essential part of the global supply chain. Additionally, Thailand's trade partnerships and efforts to boost industrial growth contribute to its attractiveness as an alternative to China for global businesses.
- Indonesia, with its abundant labour force and commitment to industrial reforms, is gradually becoming a significant player in sectors like textiles, automotive, and electronics. As the country works on improving its infrastructure and simplifying business regulations, it stands to benefit from the global shift towards alternative manufacturing hubs. Indonesia's government initiatives, such as incentives for foreign direct investment, also make it an attractive destination for companies looking to diversify their production locations.
- Mexico's close proximity to the U.S. and its participation in the USMCA (formerly NAFTA) give it a strategic advantage, particularly for companies seeking to serve the North American market. The country's strong manufacturing capabilities in automotive, electronics, and aerospace industries are bolstered by its

competitive labour costs and favourable trade conditions. As companies look to reduce supply chain risks and avoid tariffs, Mexico continues to benefit from the shifting global supply chain dynamics.

In summary, these countries—India, Vietnam, Thailand, Indonesia, and Mexico—are leveraging their competitive advantages in labour costs, trade agreements, infrastructure improvements, and government initiatives to capture a larger share of global manufacturing. As businesses look for alternatives to China, these nations stand out as key beneficiaries of the ongoing supply chain diversification.

1.1.4 India: Key Beneficiary of "China+1" and "Europe+1" Strategies

India has experienced some success with the "China Plus One" strategy, which seeks to diversify global supply chains and reduce reliance on China. However, the country has not fully capitalized on this opportunity. Several factors have contributed to India's limited success. High tariffs on raw materials and imports have made manufacturing costs higher, reducing its competitiveness. Additionally, infrastructure challenges, such as inefficient logistics, transportation bottlenecks, and power supply issues, have hindered the ease of doing business. Furthermore, internal policy barriers, including complex labour laws and rigid business regulations, have slowed down India's growth as an attractive manufacturing hub.

In comparison, countries like Vietnam, Indonesia, and Mexico have been more successful in attracting foreign investment. They offer more favourable trade conditions, lower labour costs, and have improved their business environments significantly. For instance, Vietnam has benefitted from trade agreements like the CPTPP (Comprehensive and Progressive Agreement for Trans-Pacific Partnership), while Mexico's proximity to the U.S. and the USMCA (United States-Mexico-Canada Agreement) trade agreement has been advantageous for manufacturing, especially in the automotive sector.

To improve its position and fully leverage the "China Plus One" strategy, India must address these key barriers. This includes reducing tariffs to make raw materials and imported components more affordable, improving infrastructure to streamline supply chains, and implementing pro-business reforms, such as more flexible labour laws and simplified regulations. By doing so, India can increase its appeal as a global manufacturing hub and attract more investments in the coming years.

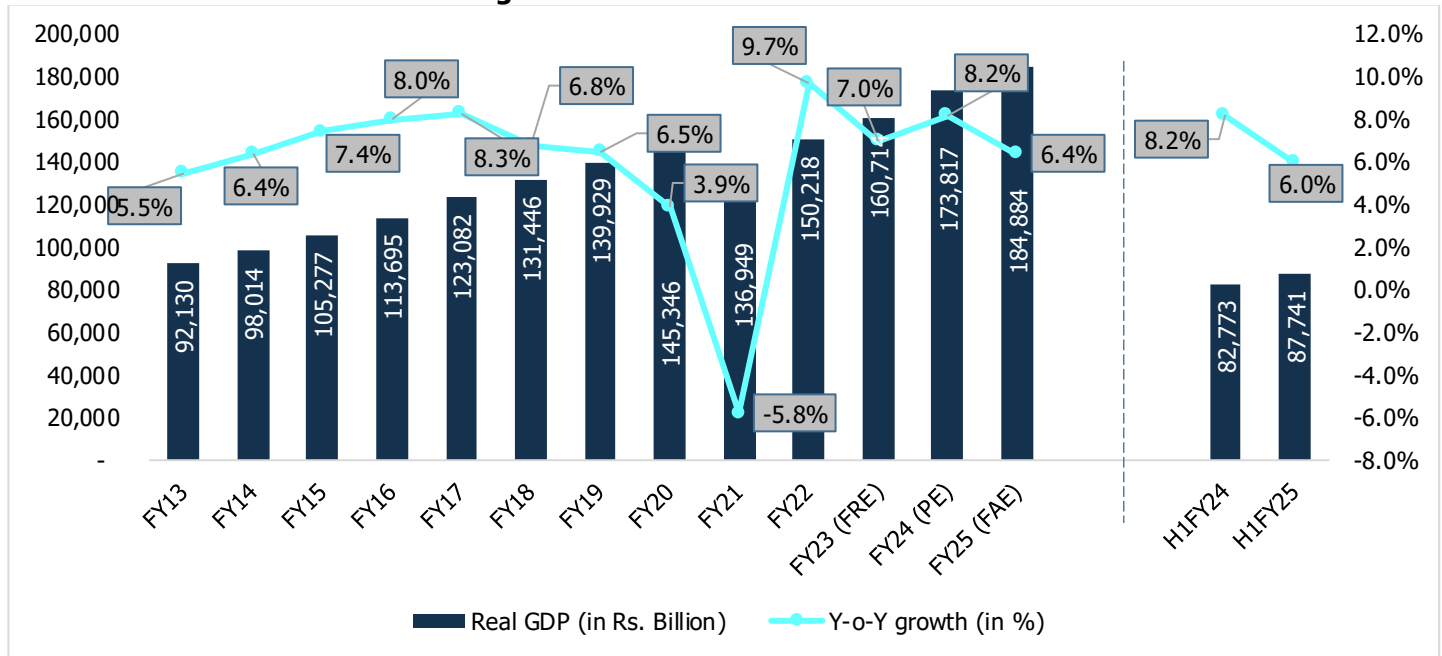
1.2 Indian Economic Outlook

1.2.1 GDP Growth and Outlook

Resilience to External Shocks remains Critical for Near-Term Outlook

India's real GDP grew by 8.2% in FY24 (Rs. 173.81 billion) and is estimated to grow 6.4% in FY25 (Rs. 184.88 trillion), driven by strong domestic demand, particularly investment. In H1FY25, GDP grew 6.0% YoY, with private consumption increasing by 6.7% and government spending contracting by 2.0%.

Chart 2: Trend in Real Indian GDP growth rate



Note: FRE – First Revised Estimates, PE – Provisional Estimate, FAE- First Advance Estimates; Source: MOSPI

- **FY26 GDP Outlook:** Real GDP growth is projected at 6.7%, balanced risks, driven by rural demand, improving employment, and robust business activity, despite global uncertainties.
- **FY25 GDP Performance:** Real GDP growth for the current year is estimated at 6.4%, with a gradual recovery expected in the coming year driven by strong agricultural activity, improving manufacturing, and resilient services, despite a slight dip in PMI services.

Persistent geopolitical tensions, volatility in international financial markets and geo-economic fragmentation do pose risk to this outlook. Based on these considerations, the RBI, in its February 2025 monetary policy, has projected real GDP growth at 6.7% y-o-y for FY26.

Table 2: RBI's GDP Growth Outlook (Y-o-Y %)

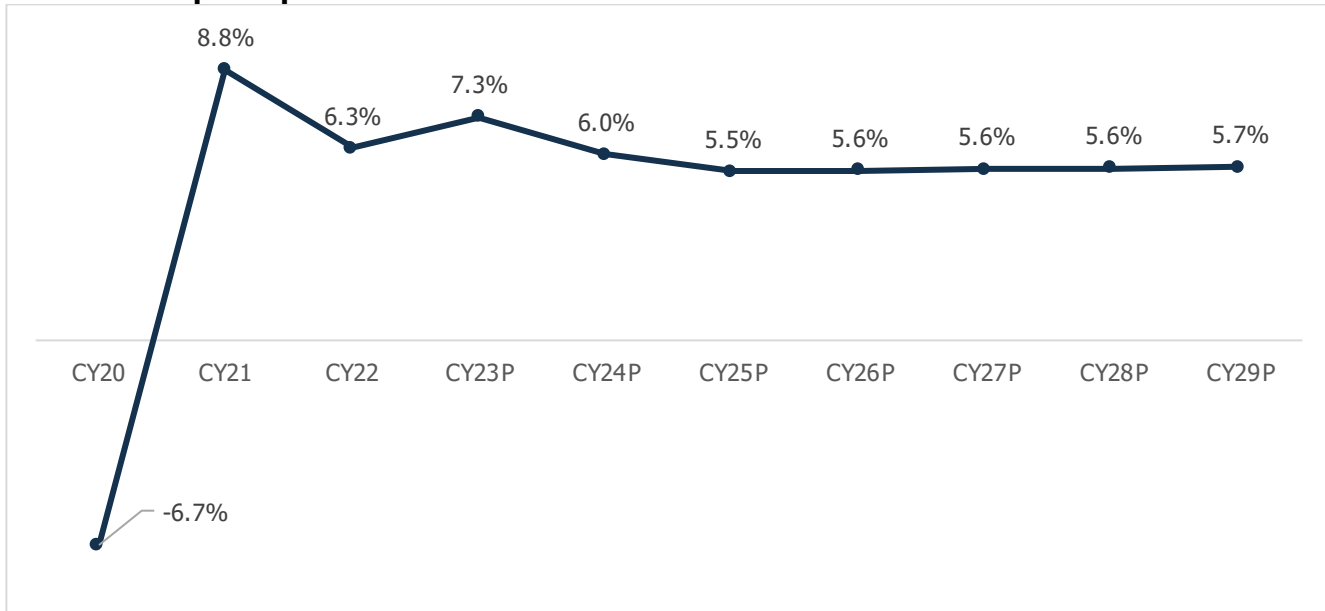
| FY26P (complete year) | Q1FY26P | Q2FY26P | Q3FY26P | Q4FY26P |
|-----------------------|---------|---------|---------|---------|
| 6.7% | 6.7% | 7.0% | 6.5% | 6.5% |

Note: P-Projected; Source: Reserve Bank of India

1.2.2 Real per capita GDP outlook

India's GDP per capita is projected to show a consistent growth trajectory over the next decade. After experiencing a sharp contraction of -6.7% in CY20 due to the pandemic, the economy rebounded with an 8.8% growth in CY21. The outlook remains strong, with annual growth rates expected to average around 5.5% to 6.0% from CY24 to CY29. This steady increase reflects ongoing economic recovery and expansion, driven by structural reforms, technological advancements, and demographic factors. Overall, India's GDP per capita is set to steadily improve, contributing to enhanced living standards and economic prosperity in the coming years.

Chart 3: Real per capita GDP outlook



P- Projections; Source: IMF- World Economic Outlook Database (October 2024)

1.2.3 Gross Value Added (GVA)

Gross Value Added (GVA) is the measure of the value of goods and services produced in an economy. GVA gives a picture of the supply side whereas GDP represents consumption.

Industry and Services sector leading the recovery charge

- The gap between GDP and GVA growth turned positive in FY22 (after a gap of two years) due to robust tax collections. Of the three major sector heads, the service sector has been the fastest-growing sector in the last 5 years.
- In FY23, **the agriculture sector** performed well despite weather-related disruptions, such as uneven monsoon and unseasonal rainfall, impacting yields of some major crops and clocked a growth of 4% y-o-y, garnering Rs. 22.3 trillion. The agriculture sector's growth slowed in FY24 to an estimated 1.4% rise for the year, down from 4.7% in FY23. The sector reached to Rs. 23.1 trillion for FY24 as per provisional estimate. In H1FY25, this sector expanded at a slower pace of 2.7% y-o-y growth. In the Interim Budget 2025-26, the application of Nano-DAP will be extended to cover all agro-climatic zones. Strategies for self-reliance in oilseeds and dairy development are to be formulated, alongside ramping up the Pradhan Mantri Matsya Sampada Yojana and establishing Integrated Aquaparks.

The FY26 Budget aims to revitalize agriculture through reforms targeting credit access, crop insurance, and agricultural value chains. It includes increasing subsidized farm loans from Rs 3 lakh to Rs 5 lakh to enhance financial inclusion and improve farmer incomes.

- The **industrial sector** output in FY23 grew by only 2.1% with estimated value Rs. 44.74 trillion owing to decline in manufacturing activities. India's industrial sector experienced robust growth in FY24 supported by positive business sentiment, falling commodity prices, and government policies like production-linked incentives. The sector grew by 9.5% on y-o-y basis, reaching Rs. 48.9 trillion for FY24. In Q1FY25, the industrial sector grew by 8.3% y-o-y as compared to 6% in Q1FY24. This growth was driven mainly by sales growth in manufacturing companies, construction, and utility services. Construction grew at the highest rate of 10.5% as compared to a growth rate of 8.3% in the same quarter in previous year.

The sector grew by 9.7% in H1FY24, while H1FY25 growth was down by 6.0% owing to positive business optimism and strong growth in new orders supported manufacturing output. India's industrial sector grew by 6.2% in FY25, reaching Rs. 52,043 billion, supported by positive business sentiment, falling commodity prices, and government initiatives like production-linked incentives. In H1FY25, growth slowed to 6.0% y-o-y, down from 9.7% in H1FY24. The growth is driven primarily by manufacturing, construction, and utility services, with construction growing at 9.1%, slightly lower than the previous year's 11.0%. Overall, H1FY24 picked up by 9.3% with manufacturing and construction activities witnessing significant acceleration.

India's industrial sector is experiencing strong growth, driven by significant expansion in manufacturing, mining, and construction. This growth is supported by positive business sentiment, declining commodity prices, beneficial government policies like production-linked incentive schemes, and efforts to boost infrastructure development. These factors collectively contribute to the sustained buoyancy in industrial growth due to which the industrial growth is estimated at 6.2% on y-o-y basis.

- The **Services sector** recorded a CAGR of 7.1% for the period FY16 to FY20, which was led by trade, hotels, transport, communication, and services related to broadcasting, finance, real estate, and professional services. This sector was the hardest hit by the pandemic and registered an 8.2% y-o-y decline in FY21. The easing of restrictions aided a fast rebound in this sector, with 8.8% y-o-y growth witnessed in FY22.

In FY23, benefitting from the pent-up demand, the services sector was valued at Rs. 80.6 trillion and registered growth of 10.0% y-o-y. In FY24, India's services sector growth was driven by steady growth in various service sector indicators like air passenger traffic, port cargo traffic, GST collections, and retail credit. With this, the growth of service sector is estimated at Rs. 86.7 trillion registering 7.6% growth in FY24 overall. In Q1FY25, the services sector grew by only 7.2% y-o-y as compared to 10.7% in Q1FY24.

In H1FY25, the services sector growth jumped to 10.3% from 9.7% in H1FY24. Within services, there was a broad-based improvement in growth across different sub-sectors. However, the sharpest jump was seen in financial, real estate, and professional services. Trade, Hotels, Transport, Communication & Services related to Broadcasting has seen a growth rate of 6.0% in Q2 of FY 2024-25 over the growth rate of 4.5% in Q2, 2023-24. In Q3FY24 growth slowed to 6.7% compared to 9.7% last year in the same quarter.

With this performance, steady growth in various service sector indicators like air passenger traffic, port cargo traffic, GST collections, and retail credit are expected to support the services sector.

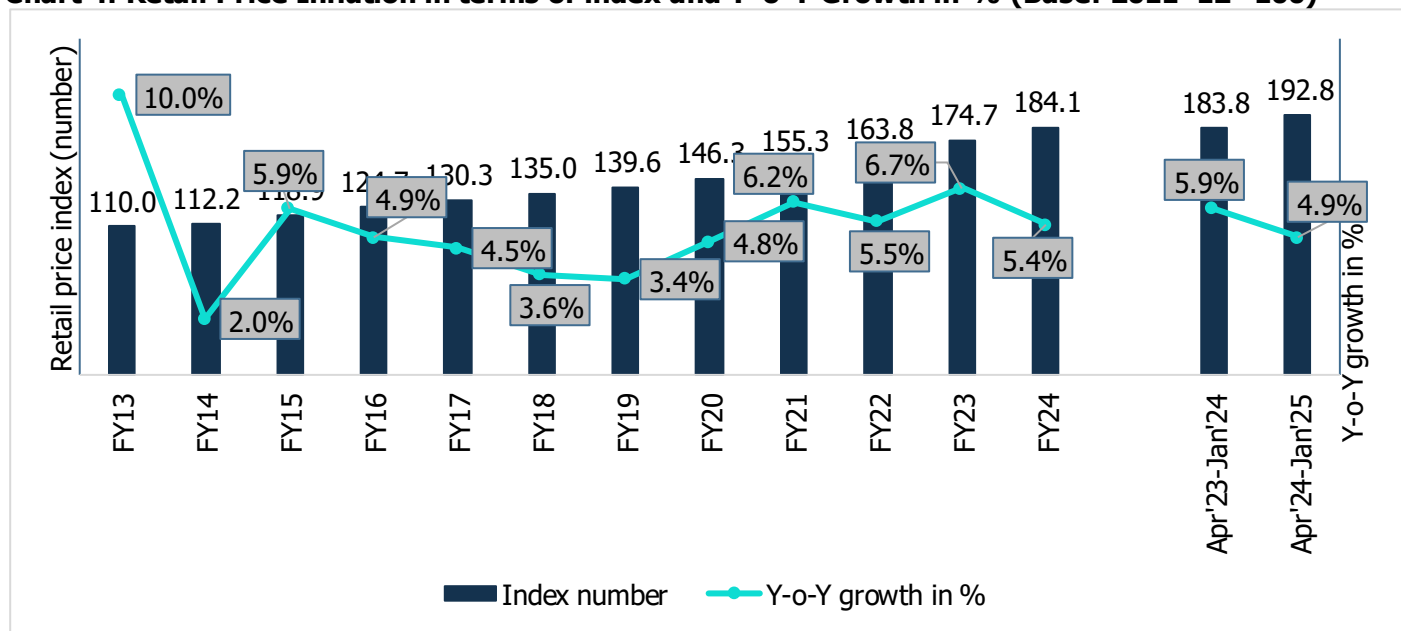
Table 3: Sectoral Growth (Y-o-Y % Growth) - at Constant Prices

| At constant Prices | FY19 | FY20 | FY21 | FY22 | FY23 (FRE) | FY24 (PE) | FY25 (FAE) | H1FY24 | H1FY25 |
|---|------------|------------|-------------|------------|-------------|------------|------------|------------|------------|
| Agriculture, Forestry & Fishing | 2.1 | 6.2 | 4.1 | 3.5 | 4.7 | 1.4 | 3.8 | 2.8 | 2.7 |
| Industry | 5.3 | -1.4 | -0.9 | 11.6 | 2.1 | 9.5 | 6.2 | 9.7 | 6.0 |
| Mining & Quarrying | -0.9 | -3.0 | -8.6 | 7.1 | 1.9 | 7.1 | 2.9 | 8.8 | 3.9 |
| Manufacturing | 5.4 | -3.0 | 2.9 | 11.1 | -2.2 | 9.9 | 5.3 | 9.6 | 4.5 |
| Electricity, Gas, Water Supply & Other Utility Services | 7.9 | 2.3 | -4.3 | 9.9 | 9.4 | 7.5 | 6.8 | 6.8 | 6.8 |
| Construction | 6.5 | 1.6 | -5.7 | 14.8 | 9.4 | 9.9 | 8.6 | 11.0 | 9.1 |
| Services | 7.2 | 6.4 | -8.2 | 8.8 | 10.0 | 7.6 | 7.2 | 9.7 | 6.1 |
| Trade, Hotels, Transport, Communication & Broadcasting | 7.2 | 6.0 | -19.7 | 13.8 | 12.0 | 6.4 | 5.8 | 6.9 | 5.9 |
| Financial, Real Estate & Professional Services | 7.0 | 6.8 | 2.1 | 4.7 | 9.1 | 8.4 | 7.3 | 9.3 | 6.9 |
| Public Administration, Defence and Other Services | 7.5 | 6.6 | -7.6 | 9.7 | 8.9 | 7.8 | 9.1 | 8.0 | 9.3 |
| GVA at Basic Price | 5.8 | 3.9 | -4.2 | 8.8 | 6.7 | 7.2 | 6.4 | 8.0 | 6.2 |

Note: FRE – First Revised Estimates, PE – Provisional Estimate, FAE- First Advance Estimates; Source: MOSPI

1.2.4 Consumer Price Index (%)

Chart 4: Retail Price Inflation in terms of index and Y-o-Y Growth in % (Base: 2011–12=100)



Source: MOSPI

The CPI (general) and food inflation in January 2025 was the lowest in Y-o-Y inflation after August 2024. CPI moderation was driven by decline in inflation in Vegetables, Eggs, Pulses, Education, Clothing, Health and Cereals etc.

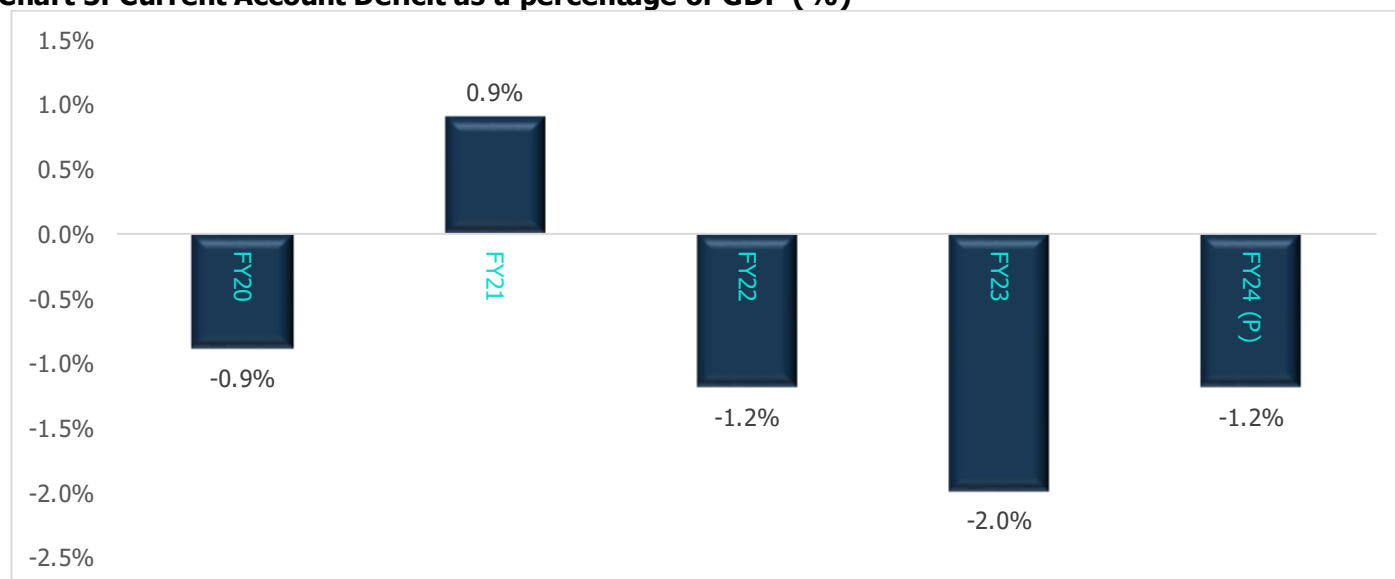
The CPI is primarily factored in by RBI while preparing their bi-monthly monetary policy. At the bi-monthly meeting held in February 2025, RBI projected inflation at 4.2% for FY25 with inflation during Q1FY26 at 4.2%, Q2FY25 at 4.5%, Q1FY26 at 4.6%, and Q3FY26 at 3.8% and Q4FY26 4.2%.

Considering the current inflation situation, RBI has cut the repo rate to 6.25% in the February 2025 meeting of the Monetary Policy Committee.

1.2.5 Current Account Deficit

The Current Account Deficit (CAD), which reflects the difference between a country's total foreign income and expenditures, is a key indicator of the strength of a nation's external sector. Between FY20 and FY24, India's Current Account Deficit (CAD) exhibited a current account surplus in FY21 attributed to reduced import absorption amid GDP contraction. India's CAD widened post FY21 from 1.2% in FY22 to USD 67 billion, or 2% of GDP in FY23. However, the trend reversed in FY24, with the deficit narrowing to USD 31.1 billion, or 1.2% of GDP. This reduction was driven by a decrease in the merchandise trade deficit, a rise in net services exports, and increased remittances. Robust global demand for India's service sectors, including IT, accountancy, and legal services, played a crucial role in this positive shift.

Chart 5: Current Account Deficit as a percentage of GDP (%)



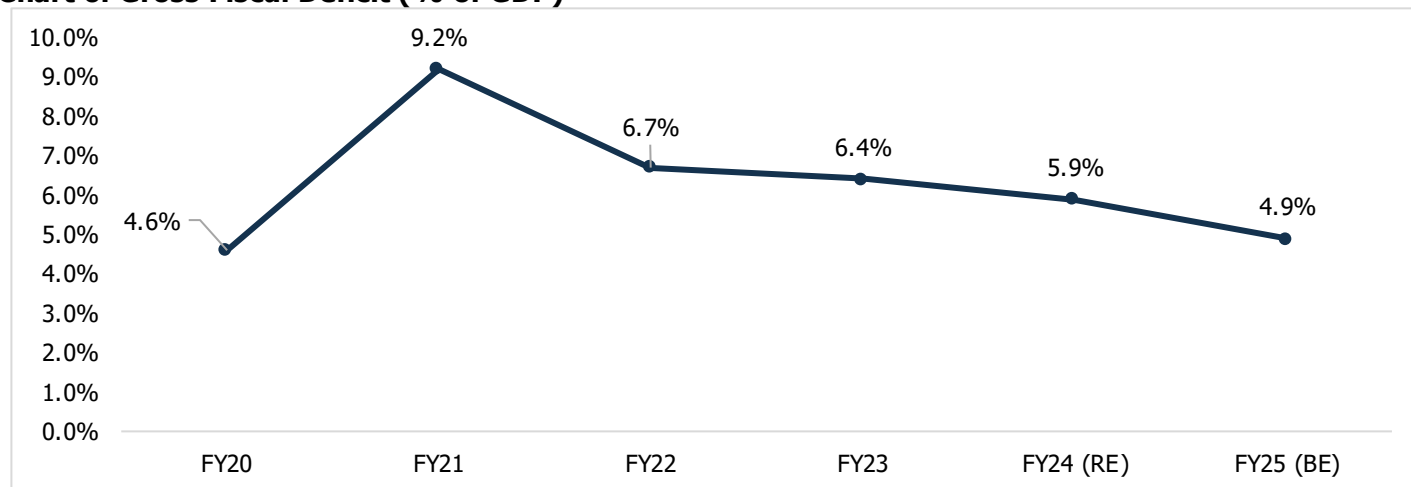
Note: P-Data are provisional and pertain to April-December 2023; Source: RBI

1.2.6 Fiscal Deficit (% of GDP)

Gross fiscal deficit in India refers to the total amount of government borrowing required to cover the gap between its total expenditure and total revenue, including both interest payments and new borrowings. Between FY20 and FY24, India's fiscal deficit reached a peak of 9.2% of GDP in FY21 from 4.6% in FY20 due to the economic impact of the COVID-19 pandemic, which led to lower tax revenues and increased government spending. However, the fiscal deficit has been steadily declining since FY21.

As of FY24, the fiscal deficit reduced to 5.9% of GDP, reflecting robust economic growth and effective fiscal measures. This reduction came amid increased tax receipts and higher non-tax revenue, with gross tax revenue growing by 13.4% and tax revenue buoyancy of 1.4. Despite a global trend of rising fiscal deficits and debt burdens, India has managed to progress towards fiscal consolidation. This can be observed from the lowering of fiscal deficit target to 4.9% of GDP in Union Budget 2024–25 signalling the government to maintain fiscal prudence.

Chart 6: Gross Fiscal Deficit (% of GDP)



Note: RE-Revised Estimates, BE-Budget Estimates; Source: RBI

1.2.7 Growth of Manufacturing Sector in India

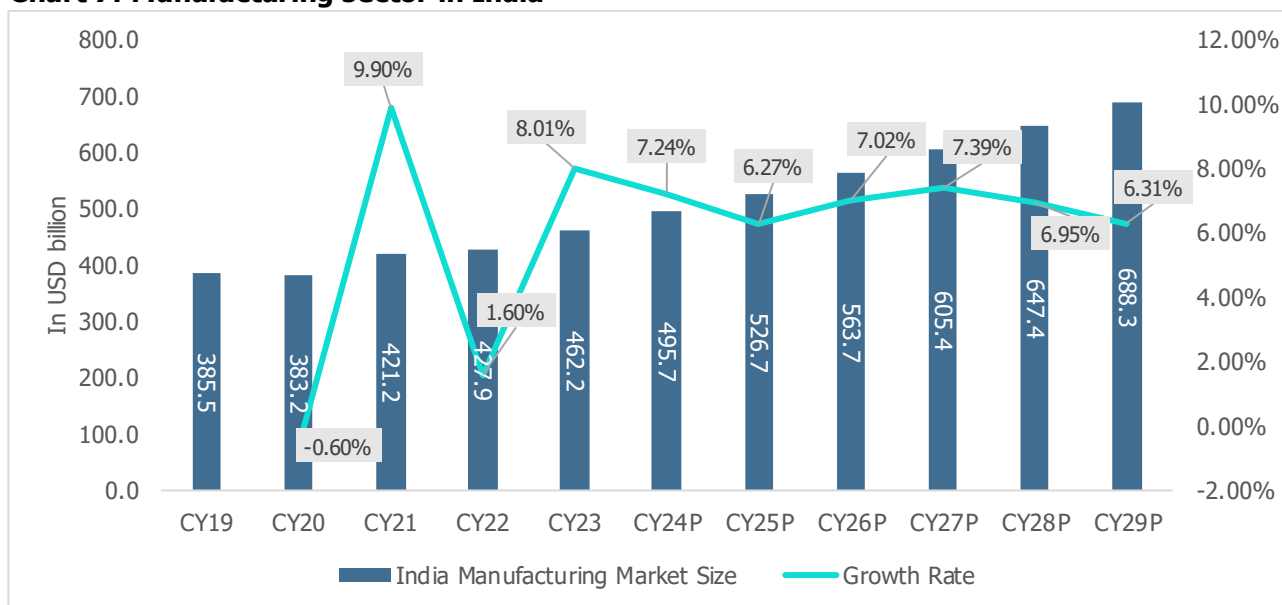
India's manufacturing industry is a crucial element in the country's economic growth, serving as a key factor in the government's ambition to elevate the nation to a \$5 trillion economy. The manufacturing industry plays a vital role in advancing GDP expansion, enhancing exports, generating job openings, and constructing essential infrastructure. India's manufacturing sector has faced difficulties and changes in its growth path, resulting in notable progress, especially following the introduction of the Make in India campaign in 2014.

The Make in India initiative has played a key role in transforming India's manufacturing sector over the past ten years by attracting investments, updating infrastructure, and enhancing the business environment. Initiatives like FDI reforms, GST, and the PLI scheme have improved the sector's competitiveness on a global scale. Despite obstacles, the manufacturing industry continues to show strength and promise for growth, emphasizing the importance of innovation, technology integration, and skills enhancement.

India's future economic growth is heavily supported by the sector's continuous success, thanks to ongoing reforms and the country's strategic partnerships with global players. With the aim of achieving a 25% share of GDP by 2025, the manufacturing sector in India is expected to have a greater impact on the country's economy.

1.2.8 Trend of manufacturing sector in India and outlook

Chart 7: Manufacturing sector in India



Source: Maia Research, CareEdge Research

The trend in India's manufacturing market size from CY19 to CY29P is projected fluctuating trend, with a slight contraction in CY20 due to the pandemic (-0.6%), followed by strong recovery in CY21 (+9.9%) and steady growth in subsequent years. The market grows at a healthy pace, averaging around 6-8% annually, driven by ongoing reforms, increasing investment, and expansion in key sectors like electronics, pharmaceuticals, and automotive. The growth rate remains steady after CY25 but remains positive, reflecting a mature and evolving manufacturing landscape.

1.2.9 Growth Drivers in the Manufacturing Sector

Growth Drivers in the Indian Manufacturing Sector (Excluding Construction and Related Segments)

India's manufacturing sector is undergoing significant transformation, driven by structural reforms, policy initiatives, and emerging opportunities across high-growth sectors beyond construction. Key growth enablers include:

- 1. Government Policy Support:** Reforms like Make in India, Atmanirbhar Bharat, and the Production Linked Incentive (PLI) Scheme) have catalyzed investment in industries such as electronics, automotive, aerospace, defense, and renewable energy, promoting self-reliance and reducing import dependency.
- 2. Industrial Incentives and Infrastructure:** The PLI scheme has played a central role in boosting manufacturing in sectors like electronics, specialty steel, and semiconductors. National infrastructure programs, such as Dedicated Freight Corridors and industrial parks, support logistics and supply chain efficiency, indirectly supporting core industrial manufacturing unrelated to construction.
- 3. Automotive and Electric Vehicle (EV) Industry:** With India becoming a hub for automotive production, including electric vehicles, there's growing demand for components like batteries, motors, power electronics, and lightweight composites, leading to significant investment in upstream and downstream manufacturing.
- 4. Electronics and Semiconductor Manufacturing:** India's ambition to emerge as a global electronics manufacturing hub is reflected in rising investments in mobile assembly, consumer electronics, and semiconductor

fabs. These segments are backed by sector-specific PLI incentives and offer substantial demand for advanced materials and industrial laminates.

6. Industrial Machinery and Capital Goods: Demand from industries such as power, mining, railways, and agriculture continues to support the production of industrial machinery, automation systems, and precision-engineered components. Manufacturers of capital goods benefit from modernization and efficiency improvements across these sectors.

7. Defense and Aerospace: Growth in the defense and aerospace sectors is supported by increased indigenization, FDI liberalization, and policy mandates for local sourcing. This is driving the manufacturing of aerospace-grade composites, electronic enclosures, high-strength laminates, and mission-critical parts.

8. Renewable Energy Equipment: India's commitment to green energy is driving manufacturing in solar panels, wind turbines, battery storage systems, and power electronics. These industries require a wide range of insulation materials, resins, and technical laminates used in energy conversion and protection systems.

9. Smart Manufacturing and Industry 4.0: Adoption of automation, IoT, AI, and data-driven process control is transforming the manufacturing ecosystem. These technologies improve operational efficiency and enable high-precision production, especially in automotive, electronics, defense, and high-value engineering.

10. Power Generation: India's power generation capacity is projected to increase significantly by 2030, encompassing both thermal and renewable energy sources, including solar, wind, and hydropower. **Renewable Energy Surge:** The country aims to achieve 500 GW of renewable energy capacity by 2030. In 2024 alone, India added substantial capacity in solar and wind energy, underscoring a significant shift towards cleaner energy sources. **Investment in Infrastructure:** The government's focus on renewable energy has led to increased investments in power generation infrastructure, attracting both domestic and international players to the sector.

11. Power Transmission: India's power transmission system has expanded at a significant pace driven by growing demand, the government's focus on providing electricity in rural areas, and the need for connecting the generation stations including integration of RE sources from the RE-rich states. From CY23 to CY29, investments are projected to continue rising, reaching Rs. 550 billion, which translates to an additional Rs. 820 billion and a moderate CAGR of about 6.9%.

1.2.10 Budget Allocation

The Indian government has significantly increased the PLI Scheme budget for FY 2025-26 to boost domestic manufacturing and global competitiveness. Major sectors like Electronics & IT Hardware saw their allocation rise from ₹5,777 crore to ₹9,000 crore, while Automobiles & Auto Components increased from ₹346.87 crore to ₹2,818.85 crore. The Textile sector also received a notable hike, with its budget growing from ₹45 crore to ₹1,148 crore.

Introduced in 2020, the PLI Scheme aims to establish India as a global manufacturing leader by offering financial incentives linked to production and sales growth. With a total outlay of ₹1.97 lakh crore covering 14 key sectors, it has already attracted ₹1.46 lakh crore in investments, driving expansion in production, exports, and employment. The initiative aligns with the Atmanirbhar Bharat vision, promoting self-sufficiency and reducing import reliance.

1.2.11 India: A Preferred Destination for Manufacturing

India has emerged as one of the leading global manufacturing hubs, fuelled by several macroeconomic factors and government initiatives. The country's growth in this sector can be attributed to a blend of advantages, including access to a large labour force, cost-effective manufacturing, strategic initiatives like "Make in India" and "Atmanirbhar Bharat,"

and a focus on technological advancement. Below are some of the key factors contributing to India's rising status as a manufacturing powerhouse:

1. Advancements in Technology & Automation

India is increasingly integrating advanced technologies into its manufacturing sector, helping companies improve productivity and quality. The rise of automation, machine learning, and AI-driven processes is making Indian manufacturers more competitive globally. The increased usage of machines and automated systems allows for more efficient and accurate production, reducing human errors, improving speed, and cutting costs. This technological shift is particularly relevant in sectors like electronics, automotive, and textiles, where high precision and quality are paramount.

2. Competitive Labour Costs

India continues to benefit from its abundant and cost-effective labour force, which is a major advantage compared to other manufacturing destinations. The country's competitive wage rates, along with its large, young, and growing workforce, make it an attractive destination for labour-intensive industries like textiles, apparel, and electronics assembly. As the cost of labour in China rises, Indian manufacturers have a significant opportunity to capture global market share.

3. Skilling & Upskilling the Workforce

To further leverage its labour advantage, India is making significant strides in skill development programs. Initiatives like the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and partnerships with global companies to offer training in cutting-edge technologies are improving the employability of the workforce. These programs are vital in ensuring that the Indian labour force can meet the growing demand for skilled technicians, engineers, and professionals in high-tech industries such as electronics, automotive, and renewable energy.

4. Government Initiatives: "Make in India" & "Atmanirbhar Bharat"

The Indian government's "Make in India" initiative, launched in 2014, has played a pivotal role in transforming India into a manufacturing hub. It aims to boost the manufacturing sector's contribution to GDP and create millions of jobs. Similarly, the "Atmanirbhar Bharat" initiative encourages self-reliance and innovation, pushing industries to reduce dependence on imports and develop domestic capabilities, especially in critical sectors like defence, electronics, and healthcare. These policies have attracted significant foreign direct investment (FDI) and helped enhance India's domestic manufacturing capabilities.

5. Production-Linked Incentive (PLI) Scheme

The government's PLI scheme has been a game-changer for several industries in India. It incentivizes companies to boost domestic production by offering financial support, which helps to reduce the cost of manufacturing in India. The PLI scheme has especially benefitted sectors such as electronics, pharmaceuticals, textiles, and automotive, attracting both global and domestic investors to set up manufacturing units in India.

6. Improvement in Ease of Doing Business

India has made remarkable progress in improving its business environment, as evidenced by its significant rise in the World Bank's Ease of Doing Business Index. In the 2020 Doing Business Report (DBR), India ranked 63rd, marking a dramatic improvement from its position of 142nd in 2014. This represents a 79-rank jump over just five years, highlighting the effectiveness of recent economic reforms.

Key reforms such as the Goods and Services Tax (GST), the Insolvency and Bankruptcy Code (IBC), and the digitalization of government processes have played a crucial role in this transformation. The implementation of GST has simplified taxation, creating a unified tax structure across the country, while the IBC has streamlined the process for resolving insolvency, providing a more predictable environment for businesses. Additionally, the digitalization of regulatory procedures has reduced bureaucratic delays, making it easier and faster to start and operate businesses.

These improvements have not only enhanced the ease of doing business but have also attracted increased foreign investment and boosted investor confidence. As a result, India's business climate is now more favourable, contributing to its long-term economic growth and positioning the country as a key player in the global market.

7. Sectoral Growth Trends

India's manufacturing sector is poised for growth, particularly in the following areas:

- **Electronics:** India has become one of the fastest-growing markets for electronics manufacturing, driven by the increasing demand for smartphones, consumer electronics, and components. The government's PLI scheme for electronics has attracted several multinational companies to set up production facilities in India.
- **Automotive:** India's automotive sector has emerged as a global manufacturing hub, with an increasing focus on electric vehicles (EVs) and automotive parts. The government's push for EVs and incentives for auto manufacturers are accelerating the sector's growth.
- **Textiles & Apparel:** India has long been a leader in textile manufacturing, and the sector is set for further expansion due to the government's focus on modernizing facilities, skill development, and providing incentives under the PLI scheme.
- **Pharmaceuticals & Healthcare:** India is already known as the "pharmacy of the world." The growing demand for generic drugs and India's focus on biopharma, medical devices, and vaccine production positions it as a critical global player in healthcare manufacturing.

8. Infrastructure Development

India's infrastructure is undergoing a massive transformation, with substantial investments in logistics, transportation, and industrial zones. Initiatives like the Bharatmala project (focused on road infrastructure) and Sagarmala (focusing on port infrastructure) are expected to significantly reduce transportation costs, making India even more attractive for manufacturing investments. Additionally, improvements in power availability and digital infrastructure are helping companies scale operations more efficiently.

9. Strategic Location and Trade Agreements

India's location at the crossroads of Asia, with easy access to key global markets, is another advantage. The country's ongoing trade agreements, such as the Regional Comprehensive Economic Partnership (RCEP) and negotiations with the European Union, will further open new markets for Indian-made goods, boosting its role in global supply chains.

10. Sustainability & Green Manufacturing

With global demand for sustainable products on the rise, India is also focusing on green manufacturing practices. The government is pushing for renewable energy adoption, promoting electric vehicles, and encouraging sustainable practices in industries like textiles, where waste reduction and water conservation are gaining importance.

1.2.12 Impact of Geopolitical Situations on India's Manufacturing Sector

Geopolitical tensions, including the ongoing Russia-Ukraine conflict, the China-U.S. trade war, and unrest in the Middle East, have had profound effects on global supply chains and manufacturing sectors worldwide, including India. India, however, is in a unique position to leverage some of these challenges and benefit from shifts in global manufacturing trends. Here's an analysis of how these geopolitical events is influencing India's manufacturing sector:

1. Russia-Ukraine Conflict

The Russia-Ukraine war has led to significant disruptions in global supply chains, particularly in raw materials such as energy, metals, and agricultural products. For India's manufacturing sector, this has resulted in:

- **Rising raw material costs:** The war has caused global prices of metals like steel, aluminum, and copper to spike, which in turn raises production costs in sectors like automotive, construction, and electronics. India, as a major importer of these materials, faces higher input costs, although it has the opportunity to boost domestic production of certain materials to reduce dependency.
- **Energy prices:** The conflict has pushed global energy prices higher, particularly natural gas and crude oil. India, being a net importer of energy, has faced increased fuel costs, affecting industries that are energy-intensive like chemicals, cement, and steel production.
- **Diversification of supply chains:** As companies look for alternatives to Russia and Ukraine as suppliers of goods and raw materials, India could benefit by attracting new business in sectors like agriculture, defence, and IT. The "China+1" strategy that many global companies are adopting also opens more opportunities for Indian manufacturing.

2. China-U.S. Trade War

The ongoing trade tensions between China and the U.S. have reshaped global trade dynamics and disrupted established supply chains. India has gained from this shift in several ways:

- **Manufacturing relocation:** Many companies are looking to diversify their manufacturing bases away from China due to tariffs and political uncertainty. India stands to benefit from the "China Plus One" strategy, as companies seek to reduce their dependence on China. India's cost-effective labour, large workforce, and improving infrastructure make it a prime candidate for companies looking to relocate production.
- **Opportunity in electronics and textiles:** With Chinese manufacturing under pressure, sectors like electronics and textiles, where India has a competitive advantage, stand to gain. India's initiatives, such as the Production Linked Incentive (PLI) scheme in electronics manufacturing, are designed to attract investment from companies looking to move their production from China.
- **Increased FDI and Trade Agreements:** As global companies seek alternative sources of manufacturing, India's favourable trade agreements, such as the Regional Comprehensive Economic Partnership (RCEP), and ongoing efforts to streamline its business environment through initiatives like "Make in India," make the country a more attractive investment destination.

3. Middle East Unrest

The political instability in the Middle East, especially conflicts in key oil-producing countries, has had a multifaceted impact on global supply chains and India's manufacturing sector:

- **Oil price volatility:** India, as a major importer of oil, faces volatility in fuel prices as tensions in the Middle East affect oil supply. High energy prices can increase production costs for energy-intensive industries in India, such as chemicals, cement, and textiles. However, India's focus on renewable energy and its push toward clean technologies may mitigate some of these risks in the long run.
- **Shift in global supply chains:** Disruptions in global energy markets and regional instability can drive companies to rethink their reliance on certain regions. India's growing infrastructure, manufacturing capabilities, and trade agreements with countries outside the Middle East such as in Southeast Asia and Europe help India attract business as companies seek more stable and diversified supply chains.
- **Boost in defence and aerospace sectors:** The geopolitical instability in the Middle East has led to an increased focus on defence and security in various countries, including India. The Indian government has been investing heavily in strengthening its defence manufacturing sector, which can be an area of growth, especially with the "Atmanirbhar Bharat" initiative.

4. Global Geopolitical Shifts - India's Strategic Position

India is strategically located between key global markets in Asia, Europe, and the Middle East. This position offers significant advantages in terms of logistics and trade access, making it a natural alternative to China for manufacturing. India can leverage these shifts by:

- **Diversifying supply chains:** Companies looking to reduce reliance on single-country suppliers, especially China, may find India an attractive destination for manufacturing and sourcing. India's relatively low labour costs, expanding infrastructure, and favourable government policies will attract foreign direct investment (FDI).
- **Increased focus on self-reliance:** Amidst geopolitical uncertainty, India is increasingly focusing on boosting its self-reliance through initiatives like "Atmanirbhar Bharat," which aims to reduce dependency on imports and enhance domestic manufacturing capabilities in key sectors such as defence, electronics, and pharmaceuticals.

6. Conclusion

The geopolitical tensions in Russia-Ukraine, China-U.S. trade relations, and unrest in the Middle East have posed challenges to global supply chains, but they also present India with significant opportunities. The country is well-positioned to capitalize on the global shift away from China through favourable trade agreements, competitive labour costs, and growing industrial capabilities. While rising energy prices and raw material costs may pose challenges, India's ongoing reforms, infrastructure development, and focus on advanced manufacturing technologies could help it emerge as a key global manufacturing hub in the coming years.

2 Global Industrial Laminates Manufacturing Industry

2.1 Overview of Industrial Laminates Manufacturing Industry

The industrial laminates manufacturing sector focuses on producing high-performance composite materials by layering substrates such as paper, fabric, and resin, which are bonded under elevated temperature and pressure. These laminates are valued for their strength, heat resistance, electrical insulation, and corrosion resistance, making them essential across multiple industries, including railways (loco transformers), electrical distribution transformers, steel, automotive and oil & gas, and construction.

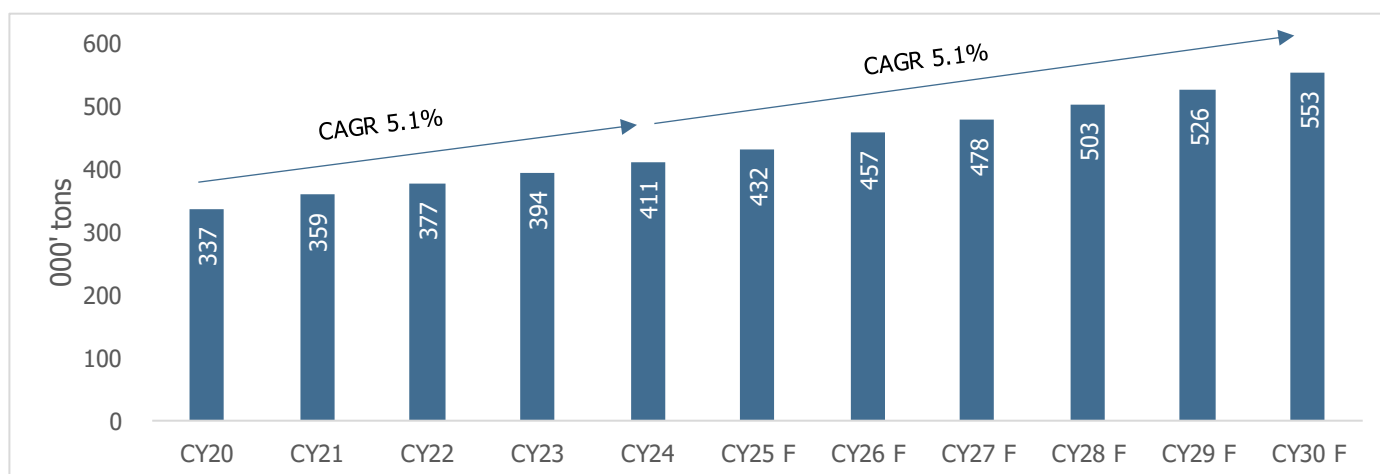
Major Applications:

- **Electrical Industry** – Used in transformers, switchgear panels, and insulation materials.
- **Railways & Automotive** – Applied in loco transformers, structural panels, and protective components.
- **Oil & Gas & Steel Industries** – Offers excellent durability in demanding environmental and chemical conditions, especially in gasket and pipeline support roles.
- **Power Sector (Generation, Transmission & Distribution)** – Employed in insulating structural components, supporting laminates in transformers, arc barriers, and bushing parts. Their high thermal and dielectric properties make them ideal for generator insulation systems and substation equipment.
- **Construction & Infrastructure** – Shuttering boards, also known as formwork panels, are used in construction to create temporary molds that support and shape poured concrete until it hardens and gains sufficient strength.

2.2 Market Size of Global Industrial Laminates Manufacturing Industry

The global industrial laminates manufacturing industry is witnessing consistent growth, with sales volume increasing from 337 thousand tons in CY20 to an estimated 553 thousand tons in CY30F. This expansion is primarily driven by the rising adoption of industrial laminates across sectors such as railways, electrical transformers, automotive, oil & gas, and construction. The rapid industrialization and infrastructure development in emerging economies have further fuelled the demand for electrical equipment, mechanical components, and building materials, indirectly contributing to the industry's growth.

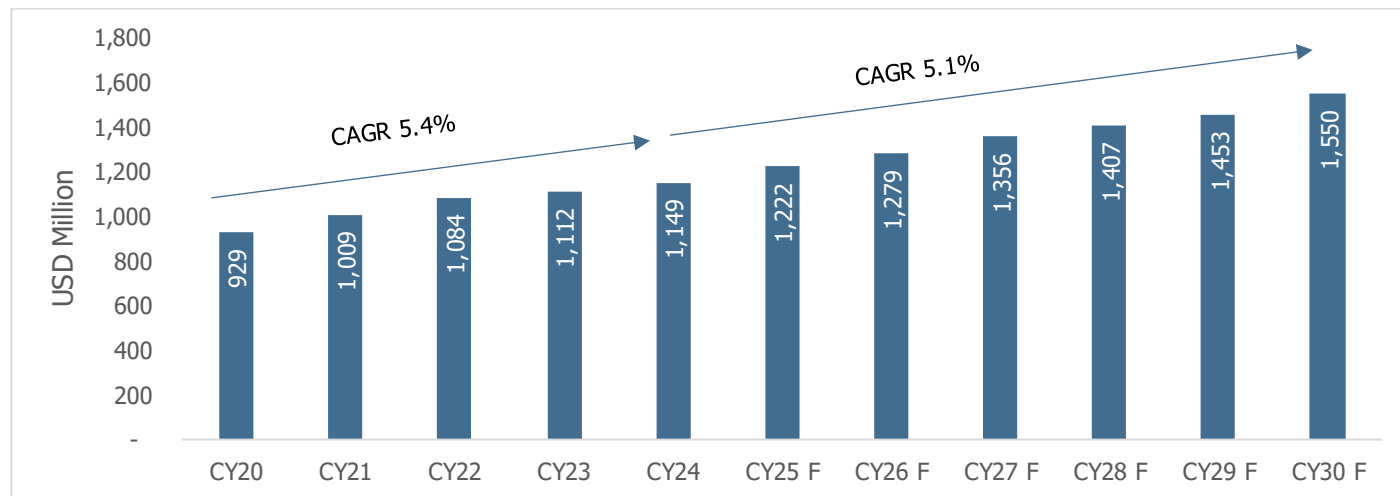
Chart 8: Global Industrial Laminates Manufacturing Industry- Sales (Volume)



Source: Maia Research, CareEdge Research

The growing focus on environmental sustainability and the enforcement of strict global environmental regulations are transforming market trends. The demand for eco-friendly laminates, including halogen-free and recyclable materials, has surged, encouraging manufacturers to invest in technological advancements and product innovation. The transition toward sustainable solutions, coupled with the need for high-performance laminates offering enhanced mechanical strength, heat resistance, and electrical insulation, is expected to drive further market expansion. As industries keep evolving, the industrial laminates sector is set for sustained growth, propelled by technological progress, regulatory shifts, and changing end-user demands.

Chart 9: Global Industrial Laminates Manufacturing Industry- Sales (Value)



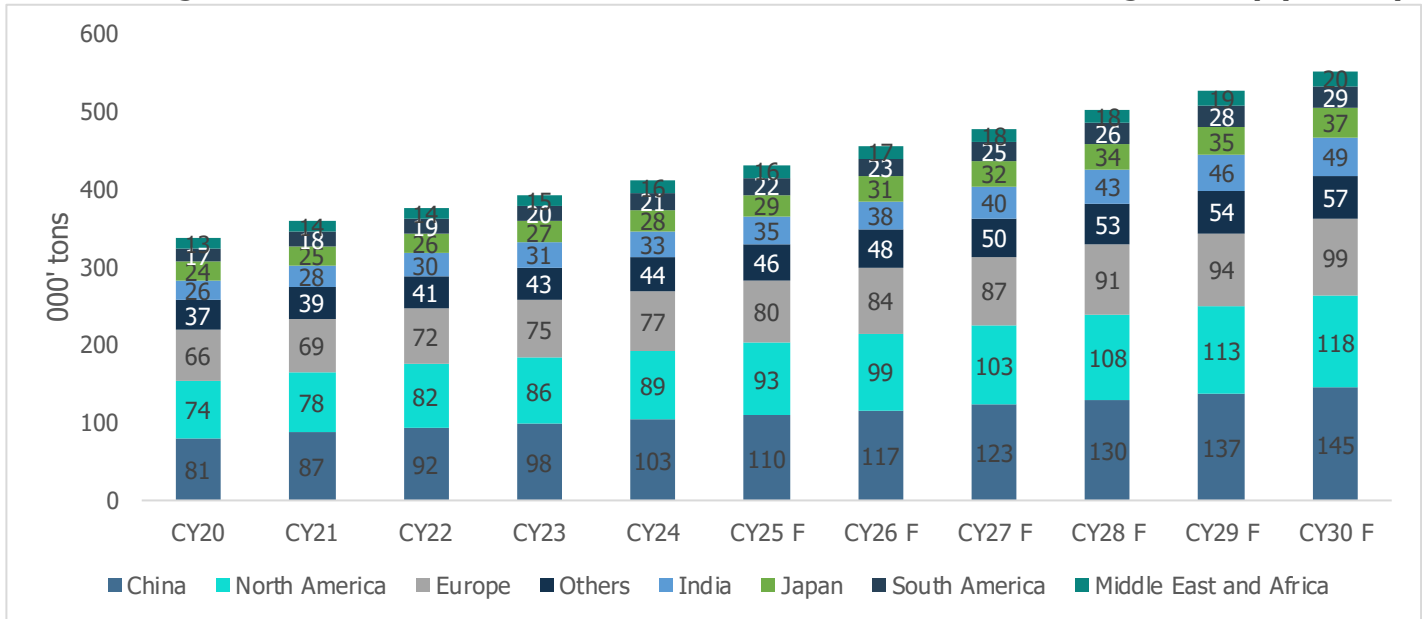
Source: Maia Research, CareEdge Research

2.3 Region- Wise Market Size of Global Industrial Laminates Manufacturing Industry

The global industrial laminates manufacturing industry is witnessing steady growth, with total sales volume expected to rise from 337 thousand tons in CY20 to 553 thousand tons in CY30F, reflecting a CAGR of approximately 5.1% (from CY24 to CY30F). Simultaneously, market value is projected to increase from USD 929 million in CY20 to USD 1,550 million in CY30F, driven by expanding industrial applications, advancements in manufacturing technologies, and sustainability trends. The rising demand for electrical insulation, automotive components, and structural materials across industries such as railways, construction, oil & gas, and electronics is significantly fuelling market expansion.

China continues to dominate the market, with sales volume expected to grow from 81 thousand tons to 145 thousand tons and market value rising from USD 186 million to USD 351 million. North America and Europe continue to be strong contributors, with projected sales of 118 thousand tons and 99 thousand tons by CY30F, respectively, and market values reaching USD 372 million and USD 303 million. Meanwhile, India and other emerging markets such as South America and the Middle East & Africa are experiencing rapid growth, driven by industrialization, infrastructure expansion, and increasing adoption of advanced materials. India's market size is expected to nearly double, reaching USD 126 million by CY30F.

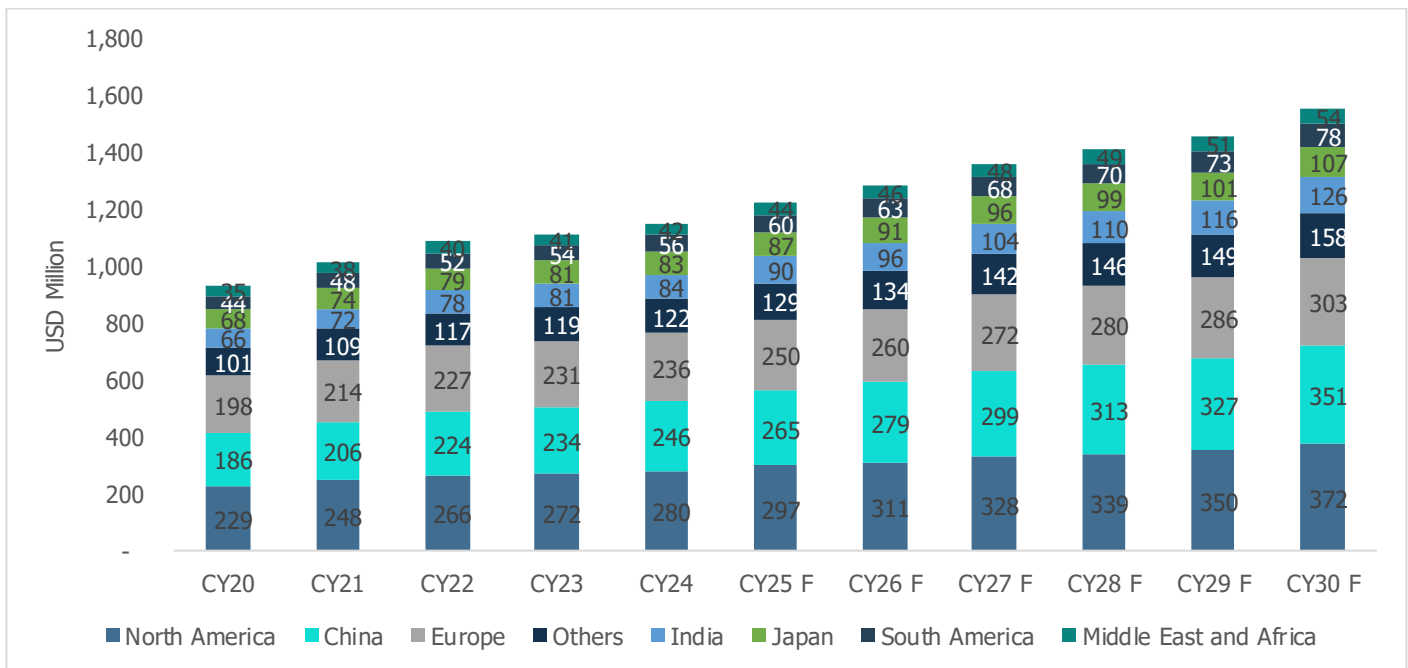
Chart 10: Region- Wise Market Size of Global Industrial Laminates Manufacturing Industry (Volume)



Source: Maia Research, CareEdge Research

The industry's growth is further driven by technological advancements, stringent environmental regulations, and a shift toward sustainable laminates, such as halogen-free and recyclable materials. As manufacturers prioritize innovation, efficiency, and eco-friendly solutions, the global market is set to expand significantly, with high-growth opportunities in developing economies and specialised industrial applications.

Chart 11: Region- Wise Market Size of Global Industrial Laminates Manufacturing Industry (Value)



Source: Maia Research, CareEdge Research

2.4 Types of Industrial Laminates Manufacturing Industry

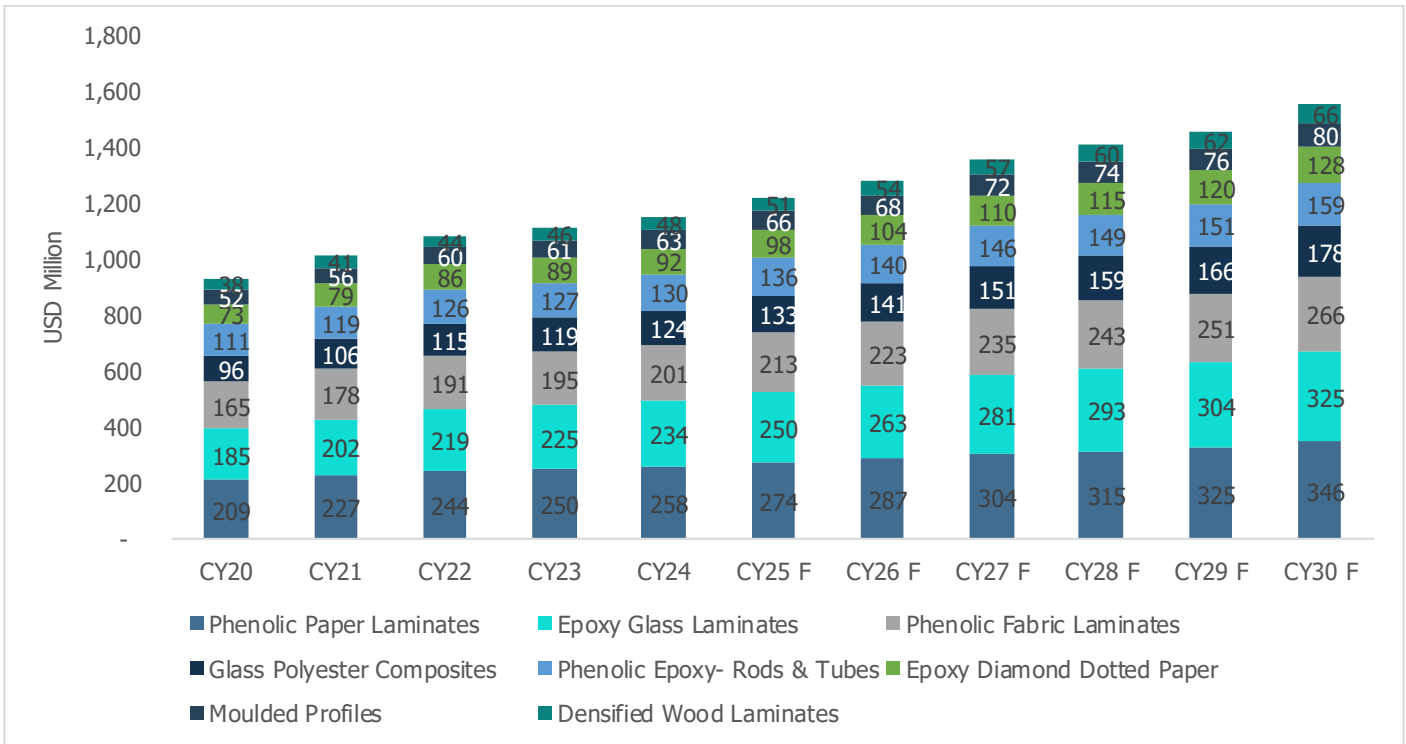
Industrial laminates are advanced materials created by combining resins with paper, fabric, glass, or wood to improve strength, durability, and insulation. Known for their mechanical toughness and thermal resistance, they are widely used across electrical, automotive, aerospace, and industrial sectors. Below are some common types of industrial laminates along with their applications.

| Types | Applications |
|-------------------------------|--|
| Phenolic Paper Laminates | <ul style="list-style-type: none"> • Manufactured by impregnating paper with phenolic resin and compressing it under heat and pressure. • Widely used in electrical insulation, switchgear panels, and PCB substrates due to their excellent dielectric and mechanical properties. |
| Glass Polyester Composites | <ul style="list-style-type: none"> • Composed of glass fibres embedded in polyester resin, offering high strength and corrosion resistance. • Commonly used in structural applications, automotive parts, and electrical enclosures. |
| Moulded Profiles | <ul style="list-style-type: none"> • Pre-shaped laminates created by moulding thermosetting resins and reinforcements into specific forms. • Used in construction, automotive, and aerospace industries for lightweight and durable components. |
| Epoxy Glass Laminates | <ul style="list-style-type: none"> • Made from glass cloth infused with epoxy resin, providing superior electrical insulation and mechanical strength. • Ideal for circuit boards, electrical insulation, and industrial machinery components. |
| Phenolic Epoxy Rods and Tubes | <ul style="list-style-type: none"> • Cylindrical and tubular laminates reinforced with phenolic or epoxy resin for enhanced mechanical durability. • Utilized in bushings, insulators, and structural applications in electrical and mechanical industries. |
| Densified Wood Laminates | <ul style="list-style-type: none"> • High-strength laminates produced by compressing wood veneers with resin under high pressure. • Commonly found in transformer supports, jigs, fixtures, and heavy-duty industrial applications. |
| Phenolic Fabric Laminates | <ul style="list-style-type: none"> • Constructed from woven fabric layers impregnated with phenolic resin, ensuring excellent wear resistance and durability. • Used in gears, bearings, pulleys, and other industrial applications requiring high mechanical strength. |
| Epoxy Diamond Dotted Paper | <ul style="list-style-type: none"> • Electrical insulation paper coated with epoxy resin dots that bond under heat, enhancing dielectric strength. • Primarily used in transformer winding insulation and high-voltage electrical systems. |
| Pultruded Profiles | <ul style="list-style-type: none"> • Product of a combination made from Fiberglass reinforcements and thermosetting resin system. They are formed by drawing continuous fiber reinforcements through a resin bath. The saturated reinforcement then enters a steel die which shapes the material into the desired profile. • Usage in a variety of Electrical applications such as Transformers, Chocks, Switchgear, On-load tap-changer insulation, Lightning Arresters, structural applications. |
| Filament Wound Tubes | <ul style="list-style-type: none"> • Manufactured by winding a band of resin-saturated rovings around a rotating mandrel. The mandrel shape forms the shape of the inside of the |

| | |
|--|--|
| | <p>tube or part. Several layers of reinforcement, each with a different wind angle, can be put in place. Following the winding operation, the tube is heat cured, and the mandrel is extracted.</p> <ul style="list-style-type: none"> Provides a very high strength-to-weight ratio, excellent electrical insulation properties and high resistance to corrosion. They are used in the manufacturing of aerospace components, automotive parts, medical devices, water treatment, etc. |
|--|--|

The paper-based laminate market is witnessing steady growth, driven by increasing demand for electrical insulation and industrial applications. Phenolic paper laminates and epoxy diamond dotted paper collectively accounted for USD 350 million in CY24 and are projected to reach USD 475 million by CY30, growing at a CAGR of 5.2%. This growth is fuelled by advancements in high-performance insulating materials, rising investments in power infrastructure, and increased adoption of laminated insulation solutions in transformers, circuit boards, and industrial equipment. Moreover, the need for environmentally friendly and cost-effective materials is influencing manufacturers to develop improved paper-based laminates with enhanced durability and electrical resistance.

Chart 12: Types of Industrial Laminates Manufacturing Industry



Source: Maia Research, CareEdge Research

A closer look at segment-wise trends reveals that phenolic paper laminates continue to hold a dominant share, growing from USD 258 million in CY24 to USD 346 million in CY30, owing to their widespread use in electrical, automotive, and industrial sectors. Meanwhile, epoxy diamond dotted paper is expected to expand from USD 92 million to USD 128

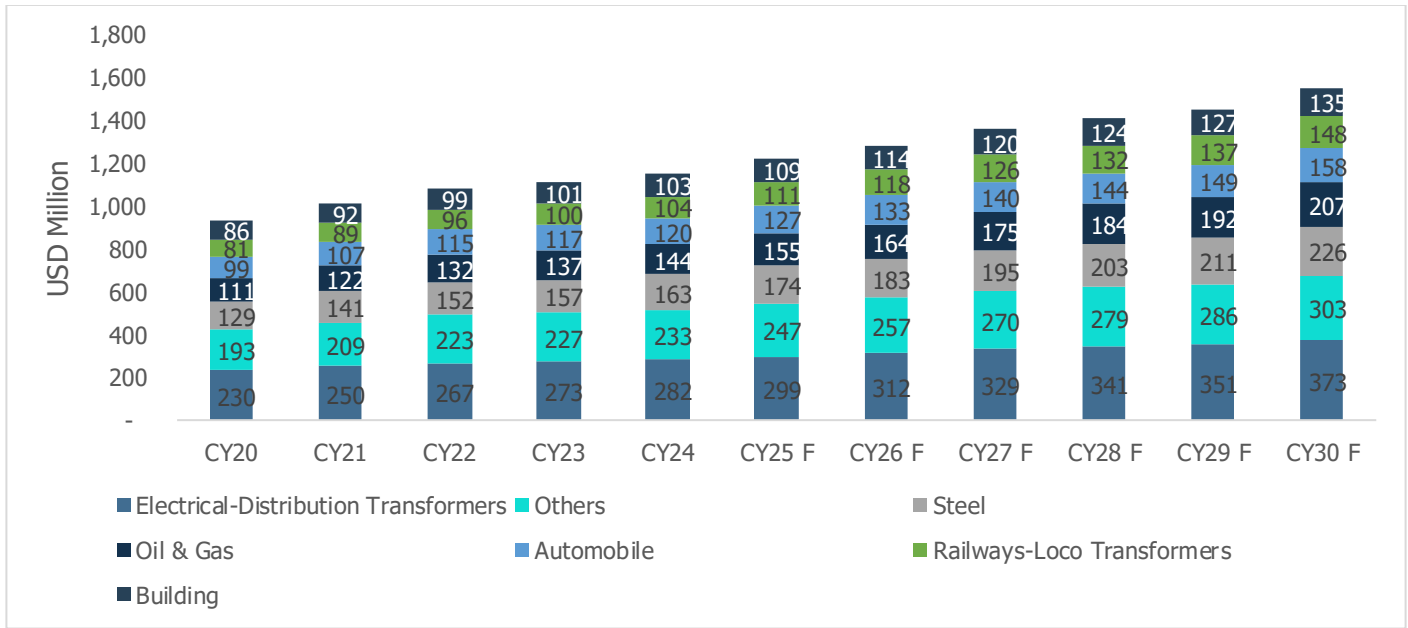
million during the same period, driven by its crucial role in high-voltage insulation applications. The market's positive trajectory suggests that continuous technological advancements, increasing industrialization, and the expansion of renewable energy projects will sustain demand, positioning paper-based laminates as a key component in the evolving electrical and industrial sectors.

Market trends indicate rapid growth across these segments, driven by the rising need for high-performance materials in electrical insulation, construction, and industrial equipment. The shift toward lightweight, durable, and environmentally friendly materials is pushing innovations in epoxy-based and composite laminates. As industries continue to modernize, the demand for industrial laminates is expected to surge, making them crucial components in the future of manufacturing and infrastructure development.

2.5 Applications of Industrial Laminates Manufacturing Industry

The global industrial laminate manufacturing industry serves diverse sectors by enhancing durability, electrical insulation, and structural strength in various applications. One of the most significant areas of usage is the electrical and electronics industry, where materials such as phenolic paper laminates and epoxy glass laminates are widely incorporated in electrical distribution transformers, circuit boards, and insulation components. These laminates offer excellent thermal resistance, mechanical stability, and dielectric properties, making them indispensable for high-voltage applications while safeguarding electrical systems from environmental and mechanical damage. The electrical distribution transformer segment, valued at USD 282 million in CY24, is projected to reach USD 373 million by CY30, growing at an estimated CAGR of 4.7%.

Chart 13: Applications of Industrial Laminates Manufacturing Industry



Source: Maia Research, CareEdge Research

In the automotive and transportation industries, laminates play a key role in railways, locomotives, and vehicle components by enhancing fire resistance, reducing weight, and improving mechanical performance. Phenolic epoxy rods and tubes are commonly used in engine compartments, battery insulation, and structural reinforcements, contributing

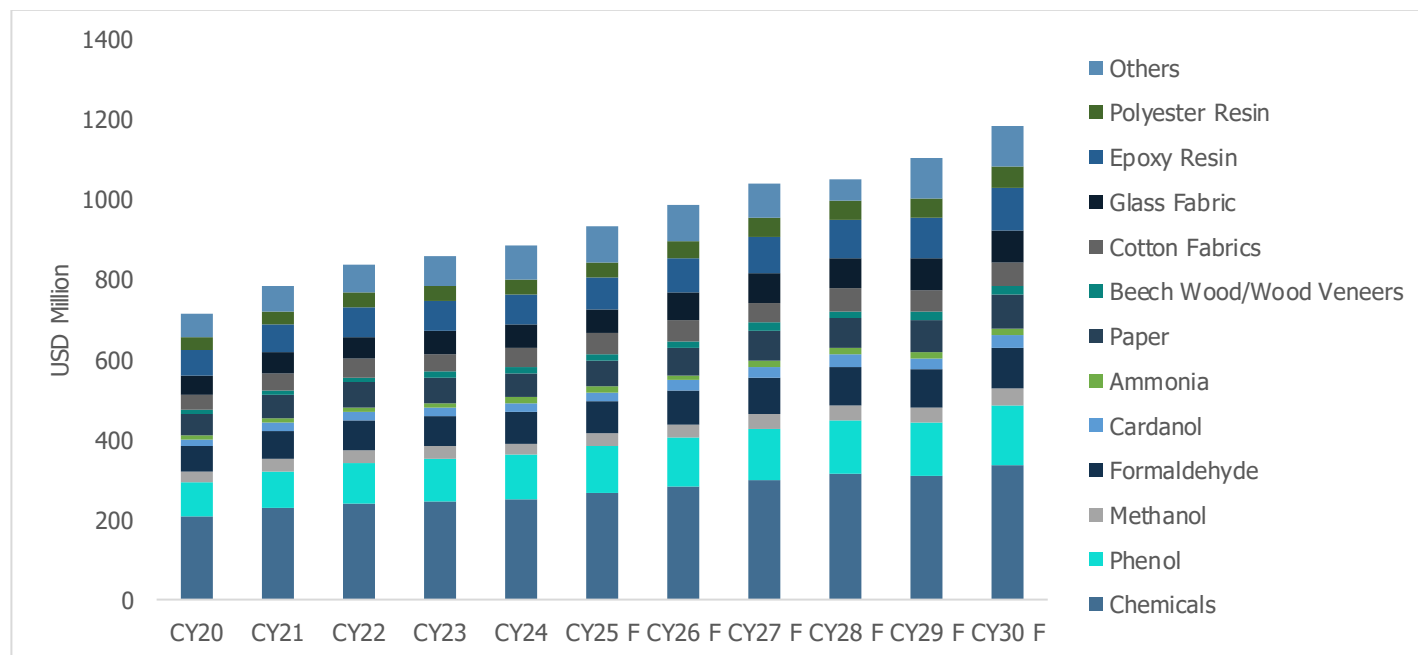
to vehicle longevity and safety. The automobile sector is expected to expand from USD 120 million in CY24 to USD 158 million by CY30, registering a CAGR of 4.7%. Additionally, the oil and gas industry rely on laminates for corrosion-resistant pipeline coatings, insulation in drilling equipment, and structural reinforcements for offshore platforms. This sector is expected to grow from USD 144 million in CY24 to USD 207 million by CY30, at a CAGR of 6.2%.

The construction and building materials industry are another major consumer of laminated composites, utilizing them for high-strength structural applications. Densified wood laminates and moulded profiles are increasingly preferred in modern infrastructure projects due to their moisture resistance, fireproofing capabilities, and mechanical durability. The building sector is expected to grow from USD 103 million in CY24 to USD 135 million by CY30, reflecting a CAGR of 4.6%. Additionally, the steel and industrial manufacturing industries incorporate laminated materials in machinery insulation, heat shielding, and wear-resistant surfaces. With continuous technological advancements, the lamination industry is poised for further expansion into aerospace, defence, and renewable energy applications, where demand for lightweight, durable, and high-performance materials continues to rise.

2.6 Raw- Materials of Global Industrial Laminates Manufacturing Industry

The global lamination manufacturing industry depends on various raw materials, with chemicals leading at USD 206 million in CY20 and projected to reach USD 338 million by CY30. Phenol, crucial for phenolic laminates, is set to grow from USD 86 million to USD 146 million in the same period. Epoxy resin, vital for high-performance laminates, is expected to increase from USD 65 million to USD 107 million. The rising demand for advanced composites in automotive, aerospace, and electronics is also driving the growth of materials like glass and cotton fabrics.

Chart 14: Raw- Materials of Industrial Laminates Manufacturing Industry



Source: Maia Research, CareEdge Research

The industry's raw materials are experiencing steady growth, with chemicals growing at a CAGR of 5% and epoxy resin at 6.1%. Paper and wood veneers are expanding due to eco-friendly trends, while polyester resin, reflects the shift

toward lightweight, durable laminates. Increasing demand for high-performance, fire-resistant, and sustainable materials is shaping the future of raw material consumption in the industry.

2.7 Key Success Factors of Global Industrial Laminates Manufacturing Industry

- The success of the global industrial laminate industry depends on innovation, efficiency, and adaptability. Materials like epoxy and phenolic laminates improve durability and performance, while automation enhances production efficiency. Customization for sectors like automotive and electrical boosts demand.
- Sustainability and compliance are also key. The adoption of eco-friendly resins and recycled materials meets environmental standards. Additionally, maintaining a stable supply chain, strategic partnerships, and market expansion ensure long-term growth in a competitive landscape.

Growing Market of Industrial Laminates Manufacturing

- **Power Sector:** The electricity demand is expected to grow globally majorly driven by the thriving wind, solar, natural gas-fired generation, and nuclear sectors. The demand is also expected to come from residential, commercial, and industrial activities and the rising electric vehicle growth. Transmission lines are high-voltage power lines that distribute electricity over a long distance from big power plants to smaller power distribution lines for use at the local level. The increasing electricity demand in the world, especially the need to integrate renewable energy into the main grid line is projected to drive the energy transition and power technologies sector globally. The transmission sector has grown at a CAGR of 8% in CY19 at Mn 78,736 USD to Mn 1,05,903 USD in CY23. Within this infrastructure, industrial laminates such as phenolic and epoxy-glass composites are essential for encoding safety and reliability. They offer superior strength, thermal resistance, and mechanical robustness in insulating components like transformer barriers, switchgear parts, and high-voltage bushings. As transmission networks scale globally to meet rising demand, these advanced laminates ensure grid infrastructure remains efficient, safe, and able to support the ongoing energy transition.
- The industrial laminates manufacturing industry in the Asia-Pacific region is experiencing rapid growth due to rapid industrialization, urbanization, and increasing demand for high-performance materials. Major players like China, Japan, and South Korea lead the market, while emerging economies such as India and Southeast Asia present new opportunities.

Potential Market of Industrial Laminates Manufacturing

South America's industrial laminates sector is poised for robust expansion, driven primarily by the region's accelerating industrialisation, infrastructure development, energy modernisation, and automation trends. As manufacturing, automotive, and industrial automation sectors intensify across the region, they require high-performance phenolic and epoxy-glass laminates for insulating components in machinery, motors, and switchgear. Simultaneously, the build-out and reinforcement of power infrastructure, underpinned by growing grid investments and renewable energy deployment, necessitates durable insulating materials such as paper-based phenolic laminates and densified wood laminates for transformers and substations. Additionally, stringent energy-efficiency regulations and industrial automation initiatives further elevate demand for these specialized laminates, supporting more resilient, safe, and efficient energy and industrial systems throughout South America.

2.8 Threats & Challenges of Global Industrial Laminates Manufacturing Industry

Raw Material Price Volatility – The price and availability of essential materials such as resins, wood veneers, and specialty chemicals can fluctuate due to supply chain disruptions, geopolitical tensions, and changing market dynamics. This impacts production costs and profit margins, making price stability a major challenge.

Environmental Regulations & Sustainability Demands – Stricter global restrictions on emissions, waste management, and hazardous chemical usage require manufacturers to implement eco-friendly practices. Meeting these regulations increases operational costs and necessitates investment in sustainable production methods.

Market Competition & Pricing Pressure – The industry faces fierce competition from both established multinational players and emerging regional manufacturers. This leads to pricing pressures, reduced profit margins, and the constant need for differentiation through quality, innovation, and cost efficiency.

Technological Advancements & R&D Costs – Rapid advancements in material science and manufacturing techniques demands continuous investment in research and development. While innovative technologies improve product performance, smaller manufacturers may not be able to afford the hefty price tag of innovation.

Economic Uncertainty & Demand Fluctuations – The industry's growth is closely tied to sectors like construction, automotive, and electronics, which are sensitive to economic cycles. Global recessions, inflation, and fluctuating consumer demand can create market instability, affecting production planning and revenue growth.

3 Domestic Industrial Laminates Manufacturing Industry

3.1 India's Industrial Laminates Manufacturing Industry Overview

The Indian Industrial Laminates Manufacturing market is experiencing steady growth, primarily driven by the rapid expansion of various industries, and government policy support. India boasts a robust and well-established industrial base, with strong sectors such as pharmaceuticals, automotive parts, steel, and chemicals, which maintain high competitiveness. Emerging industries like automotive, electronics manufacturing, and aerospace have also been growing quickly in recent years. Moreover, government initiatives aimed at fostering industrial development further contribute to the market's growth. The rising need for distribution, power, and traction transformers is also the driving factor in the industrial lamination manufacturing sector. High-performance laminations enhance efficiency, minimize losses, and support power and railway electrification.

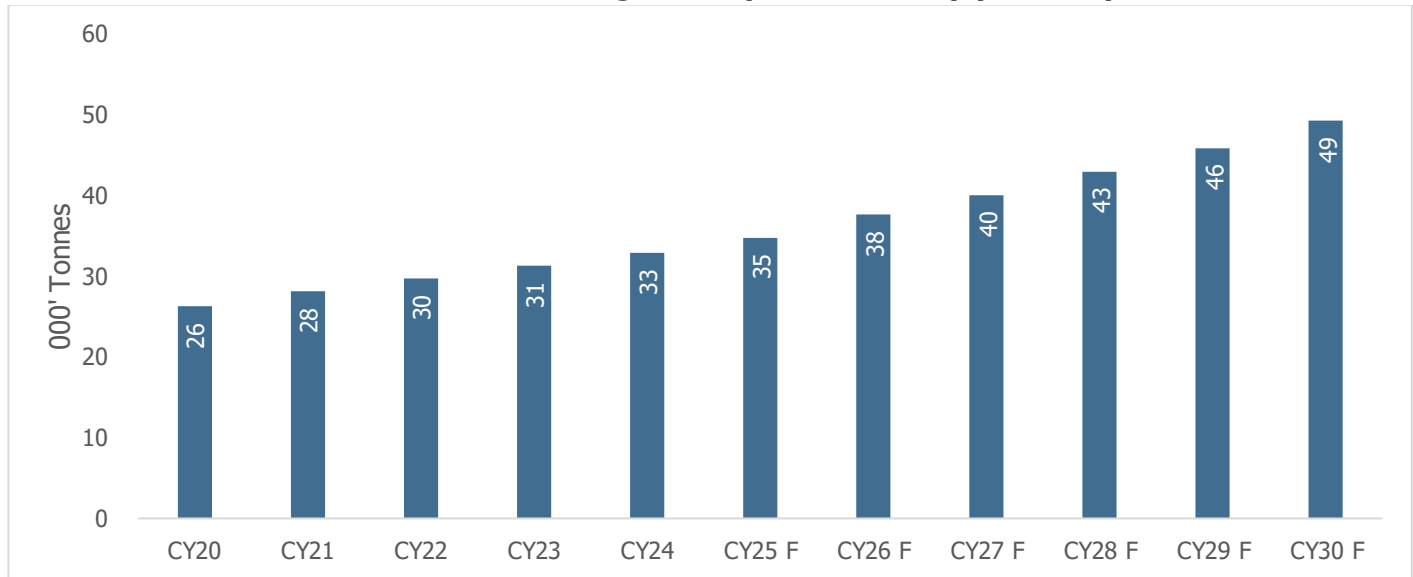
The manufacturing of industrial laminates is also witnessing a shift towards India. The country's conducive environment for manufacturing, supported by its skilled workforce and supportive policies such as Production Linked Incentive (PLI) scheme, Make in India, and Atmanirbhar Bharat not only encourages investment and self-reliance but also position it as a favourable destination for industrial laminate production. This transition aligns with the broader trend of global companies seeking to diversify their supply chains and reduce dependence on traditional manufacturing hubs.

3.2 India's Market Size of Industrial Laminates Manufacturing Industry

The industrial laminate manufacturing market in India has shown steady growth, increasing from 26 thousand tons in CY20 to 31 thousand tons in CY23. With market size reaching to 33 thousand tons in CY24 and further can expand up to 49 thousand tons by CY30, the growth is expected to be driven by the surging demand from key sectors such as consumer electronics, automotive & transportation and healthcare industry. Industrial laminates are favoured for their durability, cost-effectiveness, and versatility, making them an essential material in various commercial and industrial uses.

Additionally, rising investments in renewable energy projects and technological advancements in laminate production processes are further propelling the growth of the sector. The shift towards environmentally friendly materials and growing preference for customizable and high-performance laminates also contribute to the strong growth outlook for industrial laminate manufacturing in India, especially in the coming years.

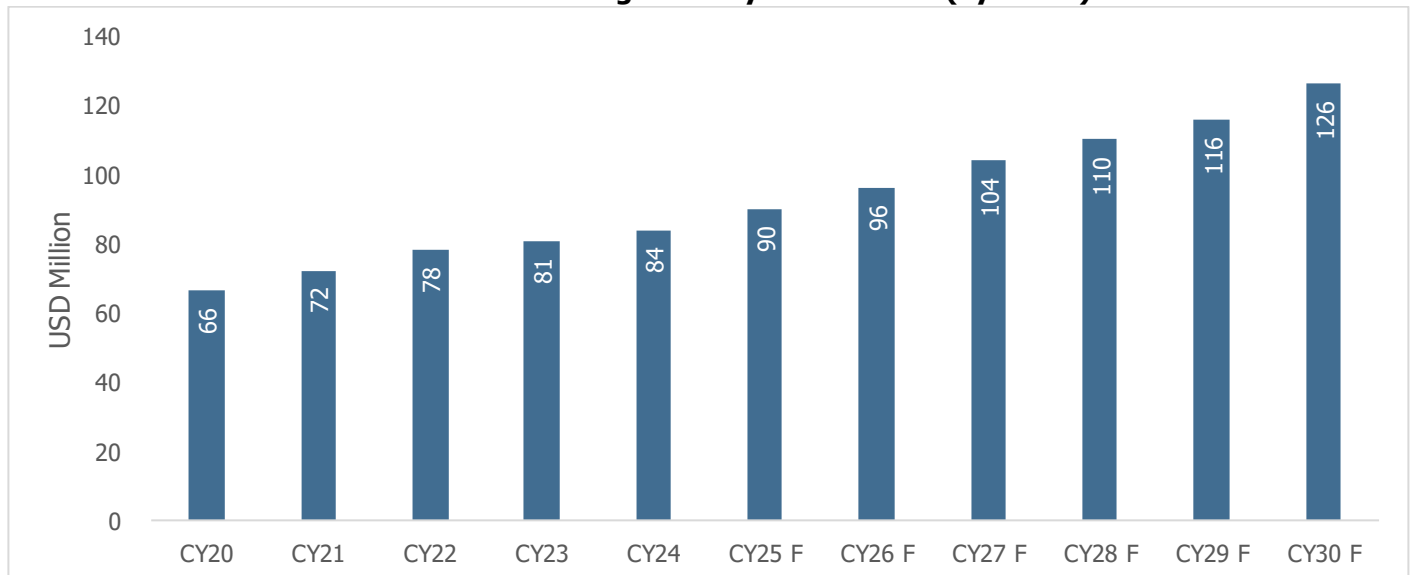
Chart 15: Industrial Laminate Manufacturing Industry Market Size (by Volume)



Source: Maia Research, CareEdge Research

The industrial laminate manufacturing industry in India is experiencing significant growth, with the market projected to rise from 66 Million USD in CY20 to 84 Million USD by CY24, and 126 Million USD by CY30. This growth is also driven by demand from sectors like automotive and machinery, where laminates are valued for their durability, cost-effectiveness, and versatility. Key factors include increasing demand for durable materials in heavy-duty applications, the focus on automation, and expanding infrastructure projects. With both domestic and global players strengthening their presence, the sector is poised for a sustained growth trajectory, with a projected CAGR of 7% from CY24 to CY30.

Chart 16: Industrial Laminate Manufacturing Industry Market Size (by Value)



Source: Maia Research, CareEdge Research

3.2.1 Growth Drivers of Industrial Laminates in India

Several key growth drivers are contributing to the expansion of the industrial laminates market in India:

1. **Expanding End-Use Industries:** Industrial laminates are integral to numerous sectors, owing to their exceptional properties such as durability, heat resistance, electrical insulation, and mechanical strength.
 - **Automotive:** In the automotive sector, industrial laminates are pivotal for enhancing vehicle performance and safety. They are utilized in dashboards, battery enclosures, under-the-hood components, and structural elements. Their lightweight nature contributes to improved fuel efficiency and extended battery range in electric vehicles (EVs). Moreover, their thermal stability and flame-retardant properties are essential for EV battery safety. India's automobile sector is projected to experience a 7–9% growth in overall vehicle sales for FY26-27, driven by sustained demand in the two-wheeler and passenger vehicle segments. This upward trend is expected to bolster the demand for industrial laminates used in automotive applications and structural components.
 - **Electrical & Electronics:** Industrial laminates are foundational in the electrical and electronics industry. They serve as substrates for printed circuit boards (PCBs), insulation materials, and enclosures. Their excellent electrical insulation and thermal stability make them ideal for high-performance electronic devices, including those in 5G infrastructure and consumer electronics. Although the current value of India's electronics production stands impressively at USD 101 billion as of FY 23, the projections indicate that India's electronics manufacturing could escalate to USD 300 billion by FY 26. With this development, the industrial laminates industry in India shall be benefited from the anticipated growth in the electronics sector, positioning itself as a key player in meeting the evolving demands of various industries.
 - **Oil & Gas:** In the oil and gas sector, industrial laminates are utilized for piping, seals, and insulation components. Their resistance to chemicals, extreme temperatures, and mechanical stress makes them suitable for harsh environments encountered in exploration and refining processes. These properties contribute to enhanced safety and longevity of equipment.
 - **Power Generation:** The growth of power generation in India significantly influences the industrial laminates sector by driving demand for electrical components such as transformers, motors, and generators. Industrial laminates, particularly electrical steel laminates, are essential in manufacturing these components due to their superior electrical properties and efficiency. As the power generation capacity expands, the need for high-quality laminates increases to ensure optimal performance and energy efficiency in electrical machinery. Moreover, the government's focus on infrastructure development and energy projects stimulates the industrial laminates market, as these initiatives require durable and efficient materials for power distribution networks and renewable energy installations. This synergy between power generation and the laminates sector underscores the integral role of energy infrastructure in fostering industrial growth and technological advancement.

2. **Technological Advancements:** Technological innovation in industrial laminates has become more advanced and efficient, driven by several key improvements such as modern resin impregnation and curing systems (like vacuum-assisted resin transfer molding) ensure thorough fibre wetting and strong cross-linking, eco-friendly bio-based resin formulations reduce environmental impact, incorporation of nanomaterials and advanced fibers enhances mechanical strength, thermal stability, and electrical insulation, fire-resistant resin chemistry boosts safety in industrial settings and automated manufacturing techniques improve precision, repeatability, and production scalability. These developments collectively yield industrial laminates that are stronger, safer, and more environmentally sustainable, meeting the demanding needs of energy, electrical systems, heavy machinery, transportation, and industrial automation.

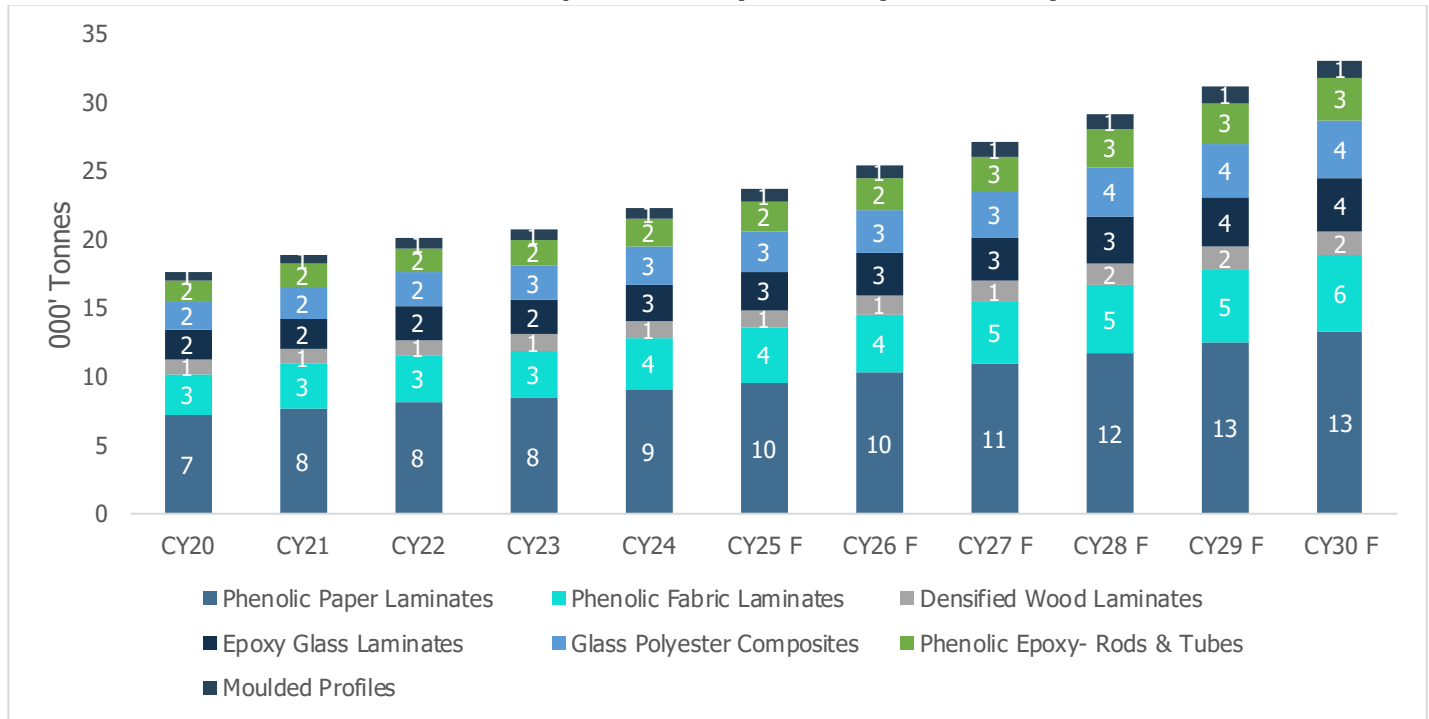
3. **Rising Export Demand:** India's increasing role as a global supplier of industrial laminates is also a significant growth driver. The country is gaining traction in international markets due to its competitive manufacturing costs and ability to produce high-quality laminates, fuelling export demand to regions like Europe, North America, and the Middle East.
4. **Sustainability Trends:** With industries becoming increasingly focused on sustainable and eco-friendly solutions, the demand for laminates made from renewable or recyclable materials is on the rise. Laminates with low environmental impact, such as biodegradable or recyclable laminates, are gaining popularity, aligning with global sustainability trends.

3.2.2 India's Industrial Laminate Export Trend

India is emerging as dominant centre for laminate exports, with increasing production capacity and a strong presence in global markets driven by demand for high-quality, sustainable materials. Leading the export growth are phenolic paper laminates, which are widely used in electrical insulation and construction due to their durability and heat resistance, projected to grow from 7 Thousand Tons in CY20 to 13 Thousand Tons by CY30. Epoxy glass laminates, with their excellent insulating properties, are gaining traction in the electronics and automotive sectors, expected to rise from 2 Thousand Tons in CY20 to 4 Thousand Tons by CY30 and Phenolic fabric laminates will grow from 3 thousand tonnes in CY20 to 6 thousand tonnes in CY30 due to rising demand for high-strength, heat-resistant, and electrically insulating materials in industries like automotive, electrical, and machinery.

Additionally, glass polyester composites are seeing increased adoption in the automotive, marine, and construction industries for their high-strength characteristics. Segments like phenolic epoxy rods & tubes and moulded profiles are also expanding due to their specialized applications in industrial machinery and infrastructure projects. India's competitive manufacturing environment, cost advantages, and robust industrial infrastructure are key factors supporting this growth. As ongoing innovation in manufacturing technologies and an expanding focus on sustainability, India's export of industrial laminates is set for sustained growth, positioning the country as a prominent player in the global market.

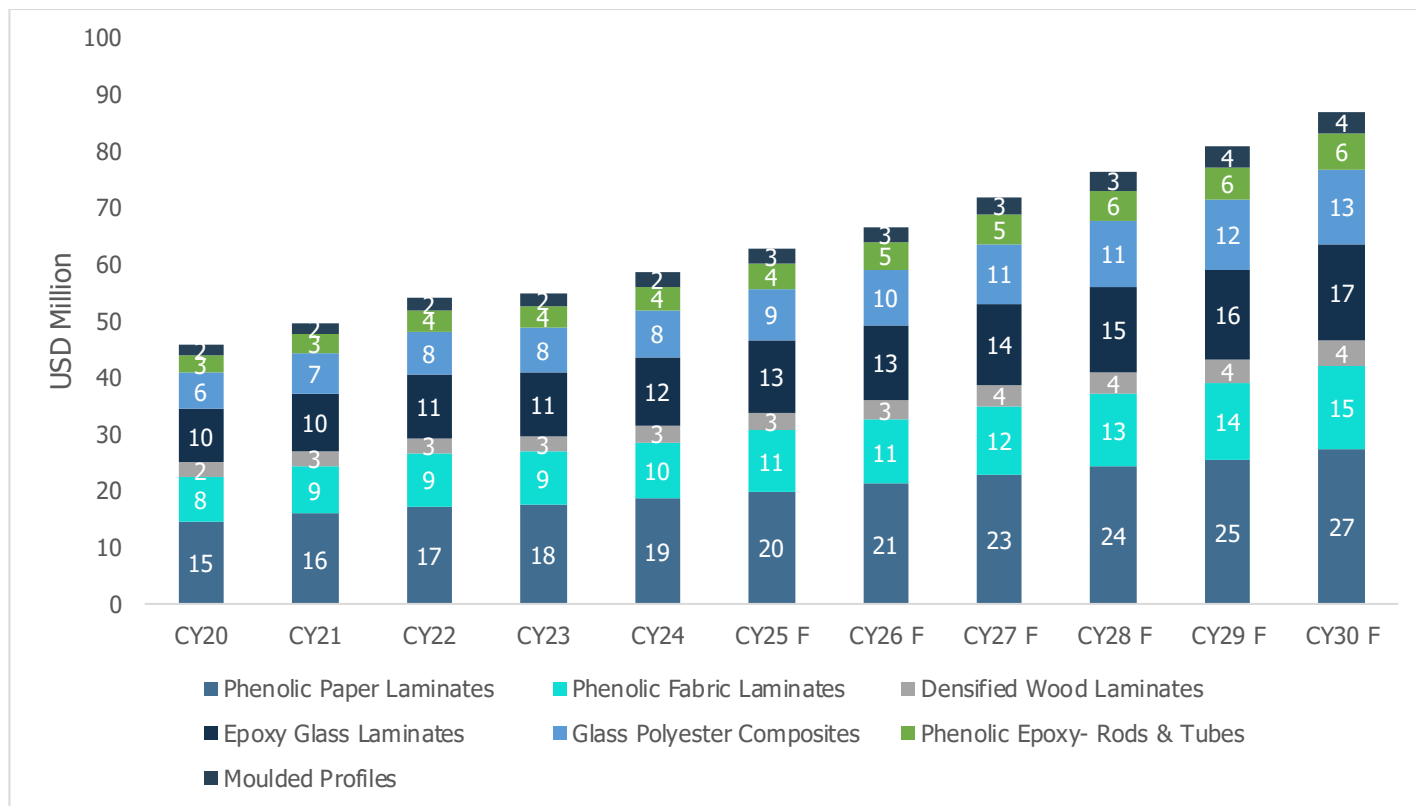
Chart 17: Indian Industrial Laminate Export Trend by Volume (000' tonnes)



Source: Maia Research, CareEdge Research

India's export value of industrial laminates manufacturing industry has seen significant growth, rising from 46 million USD in CY20 to an estimated 87 million USD by CY30. Key drivers include advancements in manufacturing, expanded product portfolios, and global demand for durable, cost-efficient materials. Phenolic paper laminates, projected to grow from 15 million USD to 27 million USD by CY30, are popular in sectors like construction. Epoxy glass laminates, expected to rise from 10 million USD to 17 million USD, are in demand for their heat resistance and electrical insulation properties. Other categories like phenolic fabric laminates and densified wood laminates are also growing due to their use in automotive, electrical, and infrastructure industries. This growth is fueled by the demand for high-performance materials and sustainable manufacturing practices.

Chart 18: Indian Industrial Laminate Export Trend by Value



Source: Maia Research, CareEdge Research

3.2.3 Government Schemes for Indian Industrial Laminate

The Indian government’s various schemes and initiatives are aimed at strengthening the overall manufacturing sector, which in turn significantly benefits industries like industrial laminate manufacturing. These programs not only address specific sectoral growth but also create a conducive environment for scaling up production, encouraging innovation, and improving competitiveness on both the domestic and global stages. Here’s a more detailed explanation of how these schemes will benefit the industrial laminate manufacturing industry as a whole:

- 1. Production Linked Incentive (PLI) Scheme:** The PLI scheme plays a crucial role by offering financial incentives to manufacturers who meet specific production targets. By targeting key sectors such as chemicals, electronics, and other industrial products, the scheme indirectly benefits the industrial laminate manufacturing industry by improving the availability of raw materials and fostering a competitive environment for manufacturers. As laminates are used across multiple industrial applications, the growth of related sectors further enhances the demand for quality laminates in construction, automotive, and electronics.
- 2. Make in India:** The Make in India initiative is focused on reducing India’s reliance on imports by boosting domestic manufacturing. This has direct advantages for the industrial laminate manufacturing sector. With increased domestic production capabilities, India can establish itself as a manufacturing hub for industrial laminates, catering to both local demand and export opportunities. By encouraging investments in new

manufacturing units, this initiative drives technological advancements and infrastructure upgrades, enabling industrial laminate manufacturers to improve product quality and production efficiency.

3. **National Manufacturing Policy (NMP)**: The NMP focuses on increasing India's share in global manufacturing output. By creating a conducive environment for industries to thrive through infrastructure development, technology adoption, and financial support, the policy benefits the industrial laminate manufacturing industry. An efficient manufacturing ecosystem, improved production capabilities, and a larger skilled workforce enable laminate manufacturers to increase capacity and product offerings, thus meeting rising demand across various sectors like construction, automotive, and industrial applications.
4. **Atmanirbhar Bharat (Self-Reliant India)**: This initiative fosters domestic production by reducing dependence on imports. For the industrial laminate sector, this translates into increased focus on sourcing raw materials locally and improving the value chain. The policy also supports local research and development, ensuring that Indian manufacturers can innovate and produce high-quality, cost-effective laminates, which are competitive globally. By focusing on self-reliance, the government encourages domestic manufacturers to expand their operations and upgrade their technological infrastructure.
5. **Skill India Mission**: A skilled workforce is essential for industrial growth, and the Skill India Mission ensures that India's labor force is equipped with the necessary skills in modern manufacturing techniques. For the industrial laminate manufacturing industry, this means access to a pool of well-trained workers in design, production, and technology implementation. Skilled labour enhances productivity, reduces operational costs, and improves product quality, which ultimately strengthens the industry's ability to compete domestically and globally.
6. **Infrastructure Development Programs**: Initiatives like the National Infrastructure Pipeline (NIP) and Bharatmala aim to improve transportation, logistics, and overall infrastructure. This has direct benefits for the industrial laminate manufacturing sector by reducing the cost of raw materials, streamlining the supply chain, and ensuring faster delivery of finished products to domestic and international markets. Improved infrastructure will also attract more foreign investments in the manufacturing sector, boosting the competitiveness of Indian industries, including industrial laminates manufacturing industry.
7. **Ease of Doing Business Reforms**: The government has significantly streamlined regulatory processes and simplified approval procedures, making it easier to establish and run manufacturing businesses in India. These reforms are particularly advantageous for the industrial laminate industry, as they reduce bureaucratic delays, lower setup costs, and facilitate smoother operations. Simplified processes also encourage foreign direct investment (FDI), technology transfers, and partnerships, which are crucial for growth and modernization in the laminate manufacturing industry.

Overall, these schemes not only improve the business climate for industrial laminate manufacturers but also create a sustainable ecosystem for growth. By addressing infrastructure challenges, promoting innovation, enhancing the workforce's skills, and encouraging domestic manufacturing, India's industrial laminate sector is positioned for long-term growth, both in terms of domestic demand and global competitiveness. The combined

effect of these policies will allow industry to scale operations, improve product offerings, and tap into new market opportunities.

3.3 Types of Industrial Laminates Manufacturing Elements

1. **Phenolic Paper Laminates:** Phenolic paper laminates are engineered composites made by impregnating paper with phenolic resin, which is then subjected to high pressure and temperature for curing. These laminates offer electrical insulation, mechanical strength, and heat resistance, making them ideal for electrical and industrial applications.
2. **Phenolic Fabric Laminates:** Phenolic fabric laminates are produced by impregnating cloth (such as cotton or glass fibre) with phenolic resin and curing it under high temperature and pressure. These laminates offer outstanding mechanical strength and wear resistance, making them ideal for use in components such as bearings, gears, pulleys, and guides.
3. **Densified Wood Laminates:** Densified wood laminates are high-density, materials created by compressing layers of wood impregnated with resin. This process results in a laminate with good mechanical strength and oil absorption ability, making suitable for oil filled transformers.
4. **Epoxy Glass Laminates:** Epoxy glass laminates are manufactured by bonding glass fibre cloth with epoxy resin and curing it under controlled conditions. With outstanding mechanical strength, electrical insulating properties, and resistance to chemicals, these laminates are ideal for use in gaskets, electrical insulators, and motor wedges.
5. **Glass Polyester Composites:** Glass polyester composites offer a cost-effective solution where both arc resistance and electrical insulation are required. These laminates are commonly used in applications such as dry-type transformers, switchgear mounting panels, and electrical barriers.
6. **Phenolic Epoxy Rods & Tubes:** Phenolic epoxy rods and tubes are cylindrical materials made by from phenolic or epoxy resins, providing high mechanical strength, heat resistance, and electrical insulation. These materials offer superior performance compared to shapes cut from sheets, while serving similar applications as sheet-based laminates.
7. **Molded Profiles:** Molded profiles are custom-shaped materials created by heating and pressurizing resins and reinforcing agents like fibers or fillers in molds. These profiles offer high strength, corrosion resistance and excellent dimensional stability, making them ideal for use in automotive, aerospace, and industrial components.
8. **Epoxy Diamond Dotted Paper:** Epoxy diamond-dotted paper is an insulation material partially coated with epoxy resin on one or both sides, offering strong adhesive properties to prevent displacement of winding layers under short-circuit forces. It is widely used in electrical motors, transformers, and various other electrical equipment.

The top three elements in terms of volume are Phenolic Laminates, Epoxy Glass Laminates, and Densified wood Laminates. Phenolic Paper Laminates are projected to increase from 9 thousand tons in CY20 to 17 thousand tons by CY30, making up a huge portion of the total volume, driven by their wide usage in industries like aerospace and defence and electrical components due to their cost-effectiveness and durability. Phenolic Fabric Laminates are forecasted to grow from 4 thousand tons in CY20 to 7 thousand tons by CY30, benefiting from their strength and versatility in industrial applications, contributing to about 15% of the total volume in CY2024. Epoxy Glass Laminates are expected to increase from 3 thousand tons in CY20 to 6 thousand tons by CY30, contributing to 13% of the total volume in 2024, due to its excellent electrical insulation and heat resistance properties, driving demand in electronics and automotive industries.

Densified Wood Laminates are projected to grow from 1 thousand tons in CY20 to 2 thousand tons by CY30, while Moulded Profiles is expected to rise from 1 thousand tons in CY20 to 2 thousand tons by CY30.

The remaining laminate types, including Glass Polyester Composites, Epoxy Diamond Dotted Paper, Phenolic Epoxy-Rods & Tubes, and Moulded Profiles, might see steady growth driven by specialized applications. Though smaller market segments, they remain essential in automotive and railway engineering, and industrial machinery and construction, automotive, and consumer goods. The total laminate volume is expected to reach 49 thousand tonnes by CY30, reflecting sustained growth.

From CY24 to CY30, the projected CAGR for Phenolic Paper Laminates is 6.8%, for Phenolic Fabric Laminates is 6.6%, and for Epoxy Glass Laminates is 6.4%.

Chart 19: Types of Industrial Laminates Manufacturing Elements by Volume (000' Tonnes)



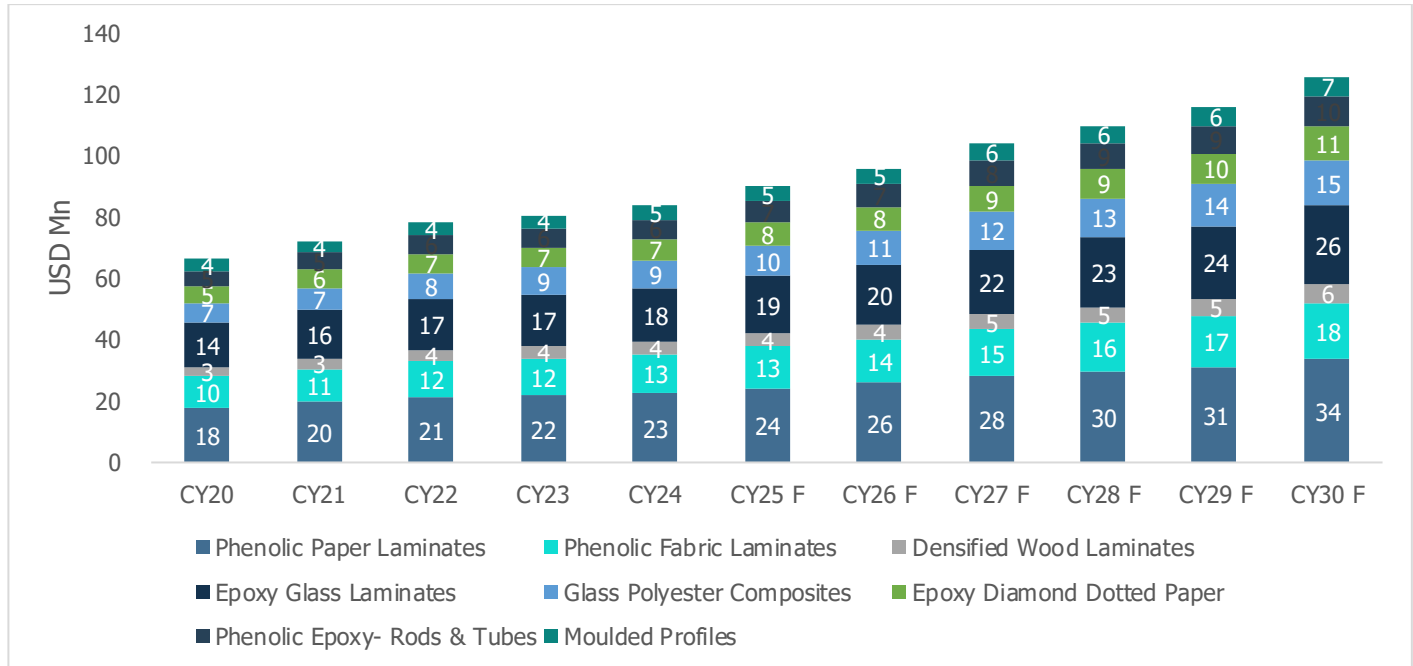
Source: Maia Research, CareEdge Research

The industrial laminate manufacturing industry market (by value) is expected to grow significantly, with Phenolic Paper, Epoxy Glass, and Phenolic Fabric Laminates leading the way. Phenolic Paper Laminates are projected to increase from 18 Million USD in CY20 to 34 Million USD by CY30, driven by demand in construction, automotive and electrical industries. Epoxy Glass Laminates are forecast to grow from 14 Million USD in CY20 to 26 Million USD by CY30, due to their use in electronics and automotive sectors and Phenolic Fabric Laminates, growing from 10 Million USD in CY20 to 18 Million USD by CY30 due to their strength in industrial application. Other categories like Densified Wood Laminates and Glass Polyester Composites are also expected to see steady growth, leading to a total market value of 126 Million USD by CY30.

From CY24 to CY30, the CAGR for Phenolic Paper Laminates is 6.8%, for Phenolic Fabric Laminates is 6.6%, and for Epoxy Glass Laminates is 6.5%. These top three laminate types are experiencing rapid growth due to their increasing

applications across industries like automotive, electronics, and construction. Their steady expansion reflects the demand for durable and versatile materials in manufacturing, construction and power sectors.

Chart 20: Types of Industrial Laminates Manufacturing Elements (by Value)

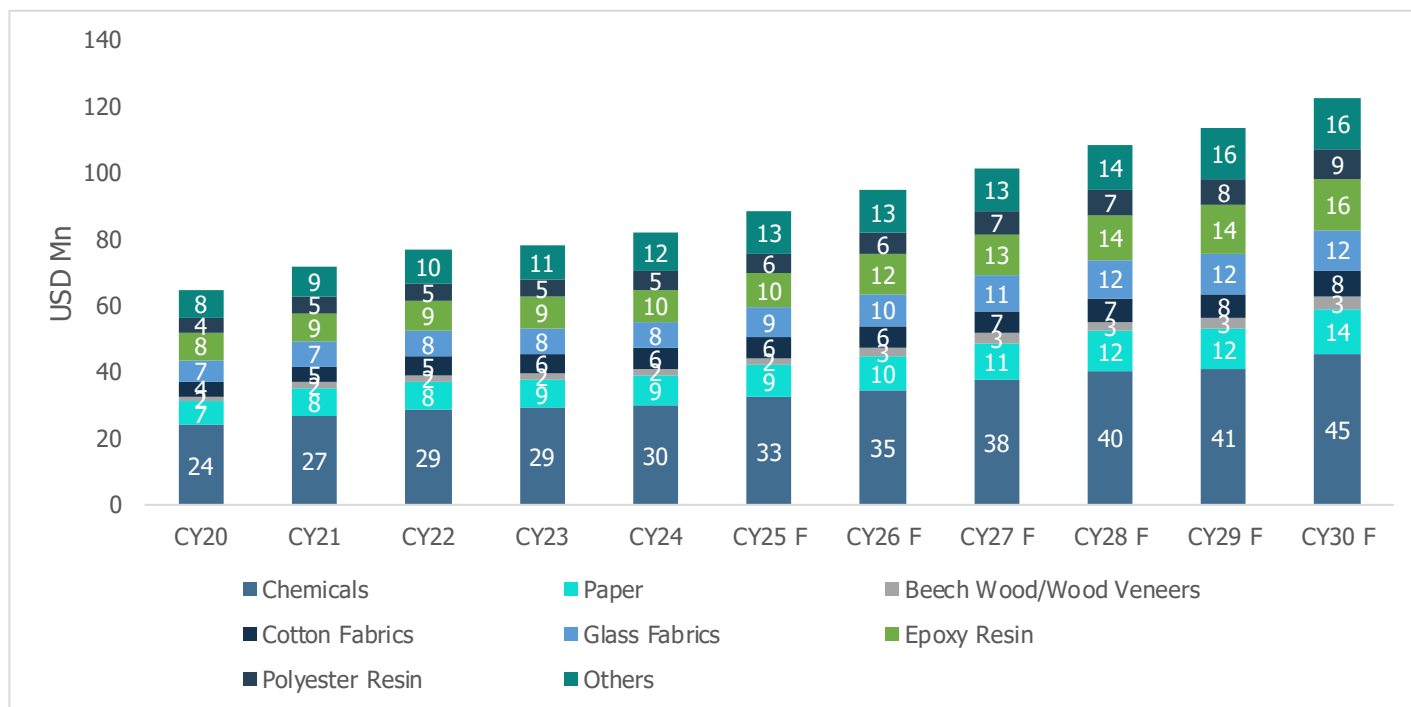


Source: Maia Research, CareEdge Research

3.4 Indian Industrial Laminate Raw Material Assessment

The raw materials for laminate manufacturing in India are diverse, with chemicals, paper, and epoxy resin being the top three contributors. Chemicals account for the largest share, growing from 24 Million USD in CY20 to a projected 45 Million USD by CY30, driven by the need for essential chemicals like phenol, formaldehyde, and methanol, which are crucial for producing various laminate products. Paper, used primarily in phenolic and epoxy laminates, has seen steady growth, reaching 9 Million USD in CY24 and expected to rise, as it remains a key component in the laminate industry. Epoxy resin follows closely, growing from 8 Million USD in CY20 to a projected 16 Million USD by CY30, fuelled by its widespread use in high-performance laminate products, especially in electronics and automotive applications. The other materials, such as cardanol, glass fabrics, cotton fabrics, and polyester resin, also contribute to the laminate production, with steady demand driven by their use in specialized laminates for diverse applications like industrial machinery, automotive, and power generation.

Chart 21: Indian Laminate Raw Material Assessment

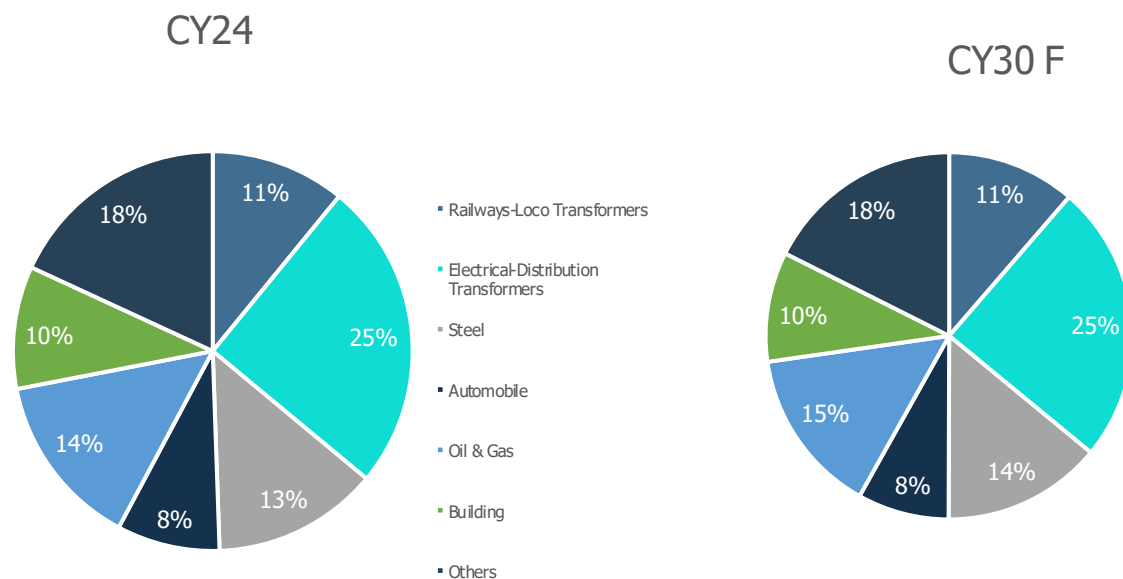


Source: Maia Research, CareEdge Research

3.5 Indian Industrial Laminates Manufacturing Industry by Application

In CY24 and CY30, laminate manufacturing materials are likely to see steady demand across various industries, driven by their versatile, durable, and cost-effective nature. Railways-Loco Transformers (11%) and Electrical-Distribution Transformers (25%) benefit from laminate use for insulation, protection, and heat resistance in electrical components. Laminate materials' ability to withstand hot temperatures and electrical currents makes them essential in these sectors. In the Steel industry (13% in CY24, 14% in CY30(F)), laminates are used for protective coatings and in machinery to resist corrosion and wear. The Automobile industry (8%) uses laminates in interior and exterior components for their durability and lightweight properties, contributing to fuel efficiency. Oil & Gas (14% in CY24, 15% in CY30 F) applications rely on laminates for corrosion resistance and durability in pipelines and machinery exposed to harsh environments. In the Building sector (10%), laminates are widely used in countertop applications that demand wear resistance, moisture tolerance, and impact strength. Others (18%) include industries such as packaging and consumer electronics, where laminates offer protective, functional, and precision support for components in harsh operational settings. Overall, the demand for laminates across these sectors is driven by their superior qualities like resistance to wear, heat, and corrosion, making them indispensable in enhancing performance and longevity.

Chart 22: Indian Laminates Industry by Application (By Volume)



Source: Maia Research, CareEdge Research

The value of the industrial laminates manufacturing industry is projected to grow across various sectors. Electrical-distribution transformers are expected to reach 33 Million USD by CY30, driven by the rising demand for energy infrastructure. Railways-loco transformers will see growth to 14 Million USD in CY30, fuelled by the need for durable electrical materials. The steel sector is projected to reach 17 Million USD in CY30, reflecting the demand for protective coatings and machinery components. Oil & gas applications are expected to rise to 19 Million USD in CY30 due to the need for corrosion-resistant materials. Additionally, the automobile and building sectors might experience significant growth as laminates contribute to improved fuel efficiency, performance, and sustainable construction. The industry's expansion is supported by these diverse factors, making industrial laminates crucial across multiple sectors.

3.6 Success Factors of Domestic Industrial Laminates Manufacturing Industry

India's industrial laminate manufacturing sector is experiencing growth driven by key factors like the availability of essential raw materials such as Phenol, Epoxy Resin, and Glass Fabric, supported by government initiatives like the PLI scheme, which reduce import dependency. The sector's expansion is also fueled by increased demand across industries such as automotive, power sector, construction, and emerging markets like renewable energy. Advanced manufacturing techniques, including automation and digital printing, improve production efficiency and quality. Skilled workforce development enhances competitiveness, both domestically and internationally. Export opportunities are growing through trade agreements like CEPA (Comprehensive Economic Partnership Agreement) and FTAs (Free Trade Agreement) with countries like Japan and the UAE, opening doors to global markets. Sustainability is also crucial, with a focus on eco-friendly practices and green technologies, aligning with the global push for sustainable materials and meeting environmental standards. These factors collectively ensure sustained growth and competitiveness for the sector.

India is the world's third-largest producer and second-largest user of energy. The installed power capacity in India increased from 356 GW in FY19 to 442 GW in FY24. By FY27E, India's total power generation capacity is expected to reach 336.6 GW for renewable energy, making it a significant contributor to the country's energy mix. By FY32E, India's power generation capacity is projected to reach an impressive 900.4 GW, driven largely by the dominance of renewables at 596.3 GW (66% of the total mix). This will significantly increase the demand for advanced insulating materials. Paper phenolic laminates, essential for high-and low-voltage insulation, thermal barriers, and tap-changers, will be critical in transformers and HV/LV switchgear to maintain grid resilience. Simultaneously, densified wood laminates, offering high mechanical strength and excellent electrical and thermal insulation in oil-immersed transformer components, will support both renewable-connected and conventional substations. These materials will therefore play a vital role in India's large-scale energy transition by enhancing the operational reliability and efficiency of power infrastructure.

Further, the rising demand for electric locomotives and high-speed rail is fueling the need for traction transformers, driving growth in the industrial lamination manufacturing industry. Advanced laminations improve transformer efficiency, minimize energy losses, and support railway electrification. With expanding investments in sustainable rail infrastructure, this sector offers significant growth potential.

3.7 Threats & Challenges Domestic Industrial Laminates Manufacturing Industry

The industrial laminates manufacturing industry in India faces several threats and challenges that could hinder its growth and sustainability:

1. **Raw Material Dependency & Price Instability:** The industrial laminate industry depends on kraft paper, resins (phenolic, melamine), and chemicals, making it prone to supply chain disruptions. Fluctuating prices of petroleum-based resins and wood pulp increase production costs and impact profitability. To reduce these risks, companies can adopt alternative materials, diversify suppliers, and implement sustainable sourcing strategies.
2. **Competitive Pressure from Low-Cost Imports:** Countries such as China, Taiwan, and Vietnam produce laminates at lower costs due to subsidies, economies of scale, and lower labour costs. This creates intense competition for Indian manufacturers, who face margin pressures due to the influx of cheap, low-quality imports.
3. **Environmental Compliance & Sustainability Concerns:** Industrial laminate manufacturing poses environmental risks, including VOC emissions, water contamination from resins, and high energy usage. It also generates hazardous waste and microplastic pollution from production scraps. Sustainable practices like low-VOC resins, water-based adhesives, renewable energy, and efficient waste management can help mitigate these impacts.
4. **High Capital Investment & Energy Expenses:** The high upfront costs associated with advanced lamination machinery present a barrier, especially for smaller manufacturers. Additionally, energy-intensive processes like extrusion and thermal lamination increase operational costs, and fluctuations in electricity prices further impact profit margins.
5. **Geopolitical Risks & Trade Barriers:** Geopolitical tensions and trade restrictions can disrupt the availability of key raw materials, further exacerbating supply chain challenges. These factors add to the uncertainty and cost pressures faced by the lamination industry.

3.8 Way Forward for Domestic Industrial Laminates Manufacturing Industry

The future of India's domestic industrial laminates manufacturing industry looks highly promising, driven by growing demand from key sectors like automotive, power generation and transmission sector, construction, electronics, and industrial applications. These sectors require durable, cost-effective, and versatile materials, which makes industrial laminates an essential part of their production processes. With the government's strategic support through initiatives such as Make in India, the Production Linked Incentive (PLI) scheme, and continuous efforts to improve the ease of doing business, there is a solid foundation for further growth in the sector.

Technological advancements are set to play a key role in shaping the industry's future. By focusing on automation, digitalization, and adopting new manufacturing technologies, industrial laminate manufacturers can improve production efficiency, reduce costs, and enhance product quality. Furthermore, the increasing adoption of industrial laminates in applications like electrical insulation, power equipment, construction materials, and automotive components presents an opportunity for manufacturers to diversify their product offerings and cater to a wider range of industries.

Additionally, the rise of organized retail, coupled with the expansion of e-commerce platforms, will make industrial laminates more accessible, even to smaller businesses and regions with developing infrastructure. As India's industrial base continues to expand, there will be a need for reliable, high-performance materials, driving further demand for industrial laminates. To stay competitive, manufacturers will also need to stay ahead of market trends by incorporating sustainable practices and ensuring their products meet the increasingly stringent environmental standards of global markets.

Overall, with the right focus on innovation, technology adoption, and leveraging government incentives, India's industrial laminate manufacturing industry is well-positioned for robust growth, offering opportunities for both domestic market expansion and global exports.

4 Competitive Landscape of Domestic Companies in the Industrial Laminates Manufacturing Industry

- Lamtuf Limited:** Lamtuf, is an industrial laminates manufacturer based in Hyderabad, India. Lamtuf has its own plant with in-house facilities for Resin making, Impregnation, Pressing and Finishing operations. The company has developed in-house products like Shuttering Film, Void Free GPO and Multi Directional Densified Wood. It has a product portfolio that includes Paper Phenolic Laminates, Cotton Phenolic Laminates, Densified Wood Laminates, Epoxy Glass Laminates, Glass Polyester Composites (GPO), and Phenolic Epoxy Rods and Tubes. It has a strong domestic and international presence. Among its peer group, Lamtuf demonstrates the strongest revenue performance and the highest profit-after-tax margins, indicating a better position in both top-line growth and profitability.

| Lamtuf Ltd. | Units | FY22 | FY23 | FY24 | FY25 |
|----------------------------|----------|--------|--------|--------|--------|
| Revenue | In Lakhs | 16,762 | 20,074 | 17,028 | 18,555 |
| EBIT | In Lakhs | 1,997 | 2,860 | 2,711 | 3,035 |
| PAT | In Lakhs | 1,343 | 2,082 | 1,980 | 2,183 |
| Net Working Capital Cycle | In Days | | 111 | 129 | 120 |
| Revenue Growth | % | - | 20% | -15% | 9% |
| EBIT Margin | % | 11.9% | 14% | 16% | 16% |
| PAT Margin | % | 8.0% | 10% | 12.0% | 12% |
| Return on Equity | % | 17.8% | 22% | 17% | 16% |
| Return on Assets | % | 9.5% | 14% | 14% | 12% |
| Return on Capital Employed | % | 22.4% | 26% | 21% | 20% |

Source: Industry Sources

- Phenolam India Private Limited:** Phenolam India Pvt. Ltd, is a manufacturer of industrial-grade phenolic laminated sheets, aluminium backup sheets, and resins. The company produces Fabric Phenolic Laminates, Paper Phenolic Laminates, Phenolic Shuttering Film, Phenolic Rods, and Fiber Under Rollers. They have presence in both domestic and international markets, including exports to the UAE, Africa, and the Middle East.

| Phenolam | Units | FY22 | FY23 | FY24 | FY25 |
|----------------------------|----------|------|-------|--------|------|
| Revenue | In Lakhs | 198 | 291 | 227 | - |
| EBIT | In Lakhs | 6 | 10 | 6 | - |
| PAT | In Lakhs | 3 | 4 | 4 | - |
| Net Working Capital Cycle | In Days | | 75 | 137 | - |
| Revenue Growth | % | - | 46.8% | -22.1% | - |
| EBIT Margin | % | 2.9% | 3.4% | 2.7% | - |
| PAT Margin | % | 1.5% | 1.5% | 1.7% | - |
| Return on Equity | % | 6.2% | 8.4% | 7.1% | - |
| Return on Assets | % | 2.1% | 2.3% | 1.2% | - |
| Return on Capital Employed | % | 8.5% | 14.0% | 7.3% | - |

Source: Industry Sources

AICA Laminates: Established in 2011, AICA Laminates has completed over thirteen years of operations in India and is a Japanese manufacturer of high-pressure and industrial laminates in the country. Its manufacturing facility located is in Rudrapur, Uttarakhand. It has established a its footprint across India, located branches that cater to regional markets. Its network, extending from metropolitan cities to smaller towns, enables distribution and easy accessibility of its laminate products. This presence supports the company to deliver customer service.

| Aica | Units | FY22 | FY23 | FY24 | FY25 |
|----------------------------|----------|--------|--------|--------|------|
| Revenue | In Lakhs | 18,760 | 23,155 | 22,738 | - |
| EBIT | In Lakhs | 1,864 | 2,647 | 2,694 | - |
| PAT | In Lakhs | 1,373 | 1,956 | 1,991 | - |
| Net Working Capital Cycle | In Days | - | 109 | 137 | - |
| Revenue Growth | % | - | 23% | -2% | - |
| EBIT Margin | % | 10% | 11% | 12% | - |
| PAT Margin | % | 7% | 8% | 9% | - |
| Return on Equity | % | 8% | 11% | 10% | - |
| Return on Assets | % | 7% | 9% | 9% | - |
| Return on Capital Employed | % | 11% | 14% | 14% | - |

Source: Industry Sources

Permal Wallace Pvt. Ltd: Founded in 1961, it established itself as a manufacturer, exporter, and supplier of composite engineering materials. Their product range includes vacuum-impregnated wood-based laminates, glass-reinforced composites and tubes, resinoid castings and prepregs using glass, carbon, Nomex, and high-silica fibers. It has a global customer base and R&D center.

| PERMALI WALLACE PRIVATE LIMITED | Units | FY22 | FY23 | FY24 | FY25 |
|--|--------------|-------------|-------------|-------------|-------------|
| Revenue | In Lakhs | 7,550 | 8,788 | 10,342 | - |
| EBIT | In Lakhs | 974 | 1,105 | 1,134 | - |
| PAT | In Lakhs | 381 | 488 | 572 | - |
| Net Working Capital Cycle | In Days | | 198 | 158 | - |
| Revenue Growth | % | - | 16% | 18% | - |
| EBITDA Margin | % | 15% | 15% | 13% | - |
| EBIT Margin | % | 13% | 13% | 11% | - |
| PAT Margin | % | 5% | 6% | 6% | - |
| Return on Equity | % | 16% | 17% | 17% | - |
| Return on Assets | % | 4% | 5% | 5% | - |
| Return on Capital Employed | % | 14% | 16% | 16% | - |

Source : Industry Sources

Paras Laminates Pvt. Ltd.: It is an Indian manufacturer specializing in industrial and decorative laminated sheets. The company offers a diverse range of products, including cotton phenolic, paper phenolic, and glass epoxy laminates, catering to various industries such as power generation, automotive, lighting, aviation, and railways. Paras Laminates exports its products worldwide, maintaining a strong presence in both domestic and international markets.

| Paras Laminates Pvt Ltd | Units | FY22 | FY23 | FY24 | FY25 |
|----------------------------|-------|-------|-------|-------|------|
| Revenue | Lakhs | 5,824 | 8,139 | 8,476 | - |
| EBIT | Lakhs | 1003 | 2218 | 3047 | - |
| PAT | Lakhs | 717 | 1614 | 2251 | - |
| Net Working Capital Cycle | Days | - | 123 | 112 | - |
| Revenue Growth | % | - | 40% | 4% | - |
| EBITDA Margin | % | 16% | 25% | 35% | - |
| EBIT Margin | % | 17% | 27% | 36% | - |
| PAT Margin | % | 12% | 20% | 27% | - |
| Return on Equity | % | 31% | 41% | 36% | - |
| Return on Assets | % | 20% | 33% | 31% | - |
| Return on Capital Employed | % | 36% | 54% | 47% | - |

Source : Industry Sources

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