
INDUSTRY OVERVIEW

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OVERVIEW OF GLOBAL AND CHINA’S PLASMA PROCESSING EQUIPMENT INDUSTRY

Definition and Classification of Plasma Processing Equipment Industry

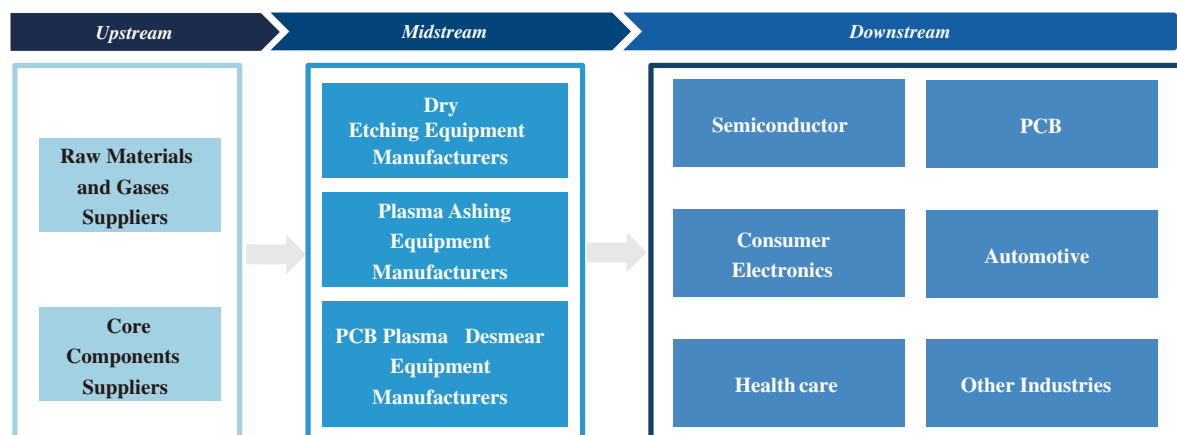
Plasma, often called the fourth state of matter, is a highly energized gas consisting of free electrons, ions, neutral atoms, and molecules. When a gas is ionized, it becomes conductive and reactive, making plasma useful in various industrial applications. Plasma is characterized by its high energy levels due to ionized particles, its ability to conduct electricity because of charged particles, and its responsiveness to electromagnetic fields, allowing precise control for specific applications. Plasma processing equipment harnesses these properties to modify materials at the atomic level, playing a crucial role in industries such as semiconductor manufacturing, surface processing, coatings, and medical sterilization.

Plasma processing works through both physical and chemical reactions. In physical processes, ionized particles are accelerated by an electric field, gaining enough kinetic energy to bombard the surface of the material being processed. This bombardment causes physical sputtering, where unwanted material is ejected from the surface and removed along with the process gases. In chemical processes, ionized particles react with the surface material, forming new compounds that are then carried away by the gas flow. Through these mechanisms, plasma processing enables functions such as surface activation to improve wettability and adhesion, cleaning to remove contaminants without damaging material structures, etching to eliminate residual molecules and weak bonds and serving as a critical step in semiconductor manufacturing, and film deposition to facilitate chemical vapor deposition and the formation of stable thin films on material surfaces.

Value Chain Analysis of Plasma Processing Equipment Industry

The upstream of the industrial chain consists of raw materials and gases suppliers, core components suppliers. Raw materials and gases suppliers provide essential inputs like special ceramics for chamber structures, quartz glass for vacuum components, and process gases for plasma generation. Core components suppliers offer key hardware such as RF generators for plasma excitation, vacuum pumps for pressure control, and precision gas flow controllers. The midstream of the industrial chain consists of dry etching equipment manufacturers, plasma Ashing equipment manufacturers, and PCB plasma desmear equipment manufacturers. These midstream players may sell equipment to end customers either through direct sales or via distributors. The downstream industries cover a wide range of fields, including semiconductors, consumer electronics, PCB, automotive, and healthcare. The demand and technological requirements from these industries directly drive the innovation and market growth of the plasma processing equipment sector.

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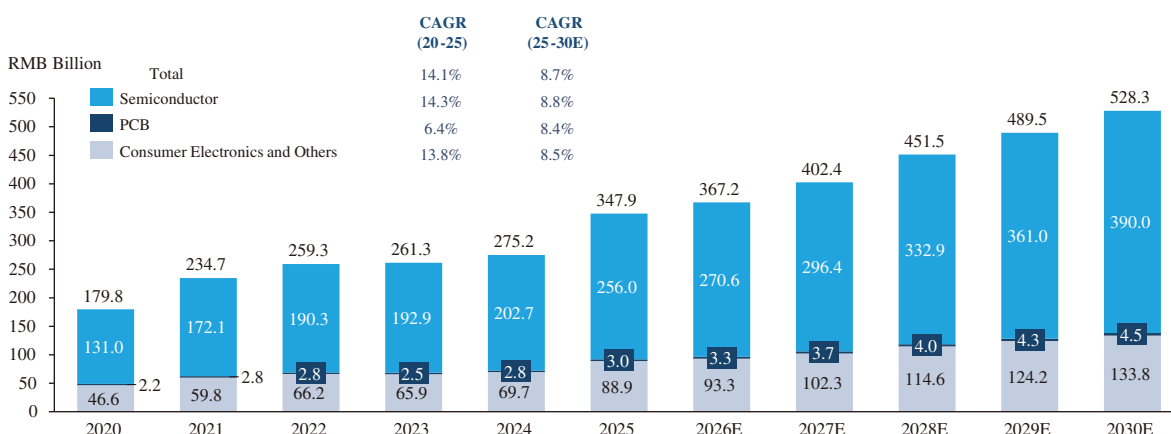


Source: Frost & Sullivan Analysis

Global Market Size of Plasma Processing Equipment Industry

Plasma processing equipment, based on its downstream industries, can be mainly categorized into three segments: semiconductor, PCB, consumer electronics and others. From 2020 to 2025, the market size of global plasma processing equipment grew from RMB179.8 billion to RMB347.9 billion, representing a CAGR of 14.1% during this period. Looking ahead, the global plasma processing equipment market is expected to reach RMB528.3 billion in 2030, indicating a CAGR of 8.7% since 2025.

Market Size of Plasma Processing Equipment Industry (Global), 2020-2030E



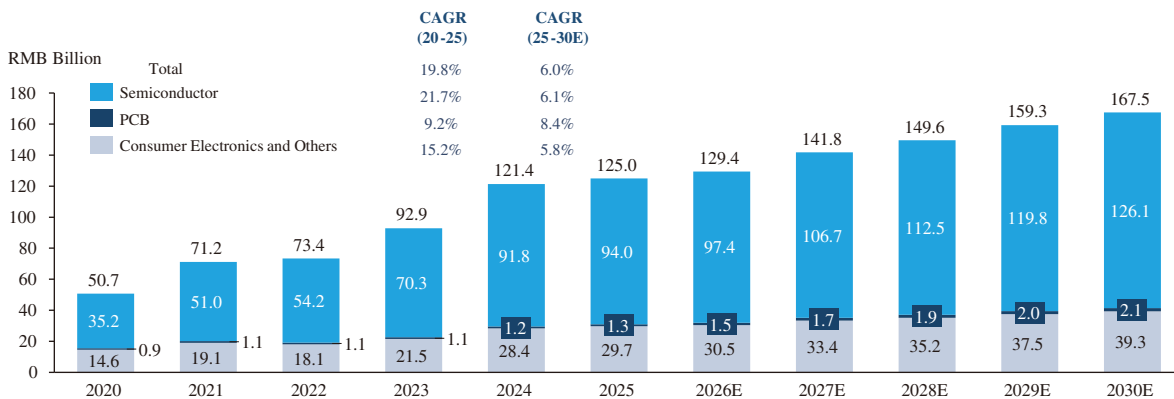
Source: SEMI, Frost & Sullivan Analysis

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China’s Market Size of Plasma Processing Equipment Industry

The China’s plasma processing equipment market grew from RMB50.7 billion in 2020 to RMB125.0 billion in 2025, achieving a CAGR of 19.8% during this period. The market size of plasma processing equipment in China is expected to reach RMB167.5 billion by 2030, representing a CAGR of 6.0% since 2025.

Market Size of Plasma Processing Equipment Industry (China), 2020-2030E



Source: SEMI, Frost & Sullivan Analysis

Entry Barrier of Plasma Processing Equipment Industry

Technical Barriers: In the plasma processing industry, particularly in etching, ashing, and PCB cleaning, technical barriers play a decisive role. The technical requirements in this industry are highly complex, involving chemical processes, physical phenomena, equipment technology, and precise process control. Etching and ashing processes must be controlled at micro or even nano scales. Therefore, only companies with advanced technologies and equipment can provide efficient and accurate solutions. As processes continue to evolve, new technologies emerge, but the ability to master and innovate within these technologies remains a significant challenge, giving well-established companies with deep technological expertise a competitive advantage.

Talent Barriers: The plasma processing industry requires highly specialized talent, especially in areas include etching, ashing, and PCB cleaning. These processes demand knowledge from multiple disciplines, including chemistry, materials science, and engineering. The technology involved is highly specialized, and there are strict safety and quality standards to adhere to. As a result, attracting and training skilled engineers and researchers is a challenge. Moreover, the knowledge and expertise required for mastering these complex processes take years to develop, which creates a significant talent barrier that makes it difficult for new entrants to compete with established players.

Experience Barriers: Experience is a crucial barrier in the plasma processing industry. Companies with years of operational experience can fine-tune their processes, improving efficiency and stability while minimizing defects. Experienced teams are able to handle complex technical issues more swiftly and accurately, ensuring product quality and consistent performance. Without this experience, new entrants struggle to optimize their processes and quickly reach the high standards set by industry leaders, making it difficult for them to compete effectively.

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Financial Barriers: The capital requirements in the plasma processing industry are considerable due to the high cost of technology and equipment. Specifically, etching, ashing, and PCB cleaning processes require substantial investment in precision equipment and continuous R&D. Additionally, the production environment itself demands significant investment in factory infrastructure, equipment maintenance, and raw materials. New entrants often face significant financial challenges in meeting these high standards, making it difficult for them to compete with established companies that have stronger financial backing.

Management Barriers: Effective management is essential in the plasma processing industry. Companies must have robust quality control systems, process management, and safety protocols in place to ensure stable production and high-quality outputs. Strong management teams are critical for optimizing production efficiency, controlling costs, and minimizing errors and defects. Established companies typically have mature management systems that allow them to adapt and respond to industry challenges more effectively. In contrast, new companies may struggle with management inefficiencies, leading to lower production quality and inconsistent results.

First-Mover Advantage Barriers: First-mover advantages in the plasma processing industry are significant, particularly in terms of product customization and long-term customer relationships. Given that plasma processing equipment typically need customized solutions to address diverse customer requirements leading companies can establish stable, long-term relationships with customers early on. As customers become more reliant on specific products and services, the switching costs for them increase. The need to customize solutions and the high costs associated with switching to another provider create strong barriers for new entrants, as they face significant challenges in breaking the established players’ hold on the market.

OVERVIEW OF GLOBAL AND CHINA’S PCB PLASMA DESMEAR EQUIPMENT INDUSTRY

Definition and Classification of PCB

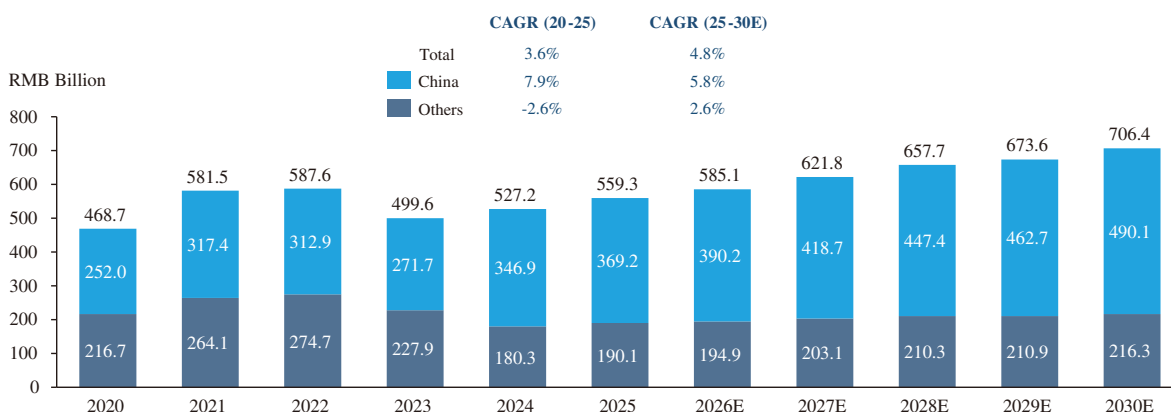
Printed Circuit Boards (PCBs), are essential electronic components that serve as the foundation for electronic parts and provide the medium for their electrical interconnections. The term “printed” in “printed circuit board” originates from the manufacturing process, which employs electronic printing techniques to create the circuitry. Based on structural complexity, PCB can be classified into single-sided PCB, double-sided PCB, and multilayer PCB. Single-sided PCB has circuits on one side and is mainly used for simple designs. Double-sided PCB has circuits on both sides and uses vias to connect the layers, allowing more complex routing. Multilayer PCB stacks multiple conductive layers separated by insulating materials to support higher circuit density and more complex electronic systems.

Global and China’s Market Size of PCB

The global PCB market increased from RMB468.7 billion in 2020 to RMB559.3 billion in 2025, representing a CAGR of 3.6% during this period. The market is expected to grow with a CAGR of 4.8% and reach RMB706.4 billion in 2030. The China’s PCB market increased from RMB252.0 billion in 2020 to RMB369.2 billion in 2025, representing a CAGR of 7.9% during this period. The market is expected to grow with a CAGR of 5.8% and reach RMB490.1 billion in 2030.

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Market Size of PCB (Global and China), 2020-2030E



Source: Frost & Sullivan Analysis

Definition and Classification of PCB Plasma Desmear Equipment

PCB Plasma Desmear: Plasma desmear equipment primarily utilizes the high-energy particles in plasma to bombard the material’s surface, causing physical and chemical changes that alter the microstructure and chemical composition of the surface. This processing method can significantly improve the surface performance of PCBs without changing the overall properties of the material. PCB surface cleaning removes oils, oxides, and other contaminants from the surface. PCB surface activation increases surface chemical reactivity by generating active sites. PCB surface modification alters the surface chemical structure to enhance properties such as adhesion, corrosion resistance, and wear resistance.

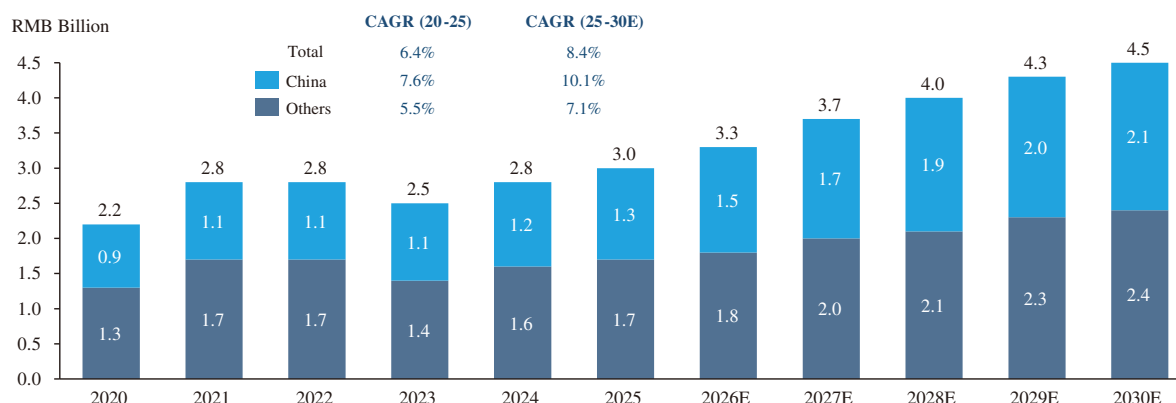
Plasma desmear technology in PCB manufacturing plays a crucial role in enhancing the quality and performance of PCB. In the pre-treatment stage, before metallization of vias, after drilling, and prior to lamination, plasma desmear process can remove surface residues (cleaning) and improve surface wettability (modification), thereby enhancing the effectiveness of subsequent processes. In multilayer PCB manufacturing, especially for high-density multilayer PCBs, plasma desmear can improve the hydrophilicity of copper foil (modification), prevent the occurrence of black holes and cracks, and enhance the bonding strength after lamination. Moreover, plasma technology can also be used for surface modification of flexible materials like PTFE and PI (modification), making them more suitable for subsequent pressing and soldering processes.

Global and China’s Market Size of PCB Plasma Desmear Equipment Industry

The global PCB plasma desmear equipment market increased from RMB2.2 billion in 2020 to RMB3.0 billion in 2025, representing a CAGR of 6.4% during this period. The market is expected to grow with a CAGR of 8.4% and reach RMB4.5 billion in 2030. The China’s PCB plasma desmear equipment market increased from RMB0.9 billion in 2020 to RMB1.3 billion in 2025, representing a CAGR of 7.6% during this period. The market is expected to grow with a CAGR of 10.1% and reach RMB2.1 billion in 2030.

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Market Size of PCB Plasma Desmear Equipment (Global and China), 2020-2030E



Source: Frost & Sullivan Analysis

Market Drivers of Global and China’s PCB Plasma Desmear Equipment Industry

Downstream Demand Driving Industry Development: In recent years, with continuous breakthroughs in next-generation information technology, the market for emerging electronic products such as in-vehicle advanced driver-assistance systems (ADAS), automotive radar, and wearable devices has rapidly risen. Under high-density assembly conditions, the reduction in component pin and micro-fine line gaps, coupled with the increasing requirements for cleanliness and surface processing precision, necessitates achieving nanometer-level surface processing to meet the manufacturing needs of next-generation micro and nano-electronic devices.

Increasing Demand of AI Server PCBs: The rapid development of artificial intelligence has boosted demand for AI server PCBs, driving growth in the PCB market and advancements in manufacturing processes. By application, the proportion of PCBs used in AI and high-performance computing field in the PCB market increased from 2.6% in 2020 to 11.1% in 2025, and will reach 16.7% in 2030. PCB plasma desmear equipment features technological advantages in precision and uniformity, rendering it suitable for the production of high-precision, multi-layer high-end PCBs. As downstream computing power infrastructure continues to evolve, demand for PCB plasma desmear equipment is expected to rise steadily in line with high-end PCBs capacity expansion.

Increasing Environmental and Regulatory Requirements: As global awareness of environmental protection in electronic manufacturing continues to rise, traditional chemical cleaning methods are gradually facing stricter limitations. Plasma cleaning technology, with its non-toxic, low-energy consumption, and no waste liquid discharge characteristics, offers an environmentally friendly surface processing solution. It meets the increasingly stringent green production standards and industry regulations, making it an important alternative to traditional wet cleaning methods. The “Industrial Structure Adjustment Guidance Catalog 《產業結構調整指導目錄》” which will be officially implemented by the National Development and Reform Commission in February 2024, explicitly includes “plasma surface processing technology and equipment” in its list of encouraged categories.

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Accelerated Progress in Automation and Intelligent Manufacturing: The widespread adoption of smart factories and automated production lines has created opportunities for the rapid integration and online application of plasma desmear equipment. Plasma desmear equipment features a high degree of automation, efficiency, and environmental sustainability. Compared to traditional cleaning agent-based equipment, it can be seamlessly embedded into the entire production process, enhancing production efficiency and ensuring better quality control, thereby enabling large-scale fully automated manufacturing. Furthermore, the application of AI technology demands enhanced server performance and computing power, which in turn imposes higher requirements on PCB boards.

Development Opportunities from China’s Manufacturing Expansion Abroad: The Chinese PCB industry has seized the opportunity presented by the sustained global growth of the PCB sector. As global PCB production capacity gradually shifts to Chinese Mainland, the country has become the largest PCB production base in the world. The manufacturing of PCBs requires a variety of precision equipment, such as plasma desmear, drilling machines, exposure machines, and etching machines. As PCB production capacity expands, the demand for these equipment types continues to grow. Domestic manufacturers of PCB plasma desmear equipment have encountered rapid development opportunities, allowing them to enhance their technological capabilities and production capacity in response to the increasing market demand.

National Policy Support for the PCB Industry: Policies such as “Made in China 2025” and the “Action Plan for the Development of Basic Electronic Components Industry (2021-2023)” have clearly prioritized the intelligent transformation of the electronics industry. These policies aim to guide the PCB industry toward high-end, intelligent, and healthy growth. “Made in China 2025” specifically outlines the goal of advancing green manufacturing, emphasizing the establishment of an efficient, clean, low-carbon, and circular manufacturing system, while significantly reducing energy, material, and water consumption. Against this backdrop, the PCB industry, as a vital part of electronic manufacturing, has seized the opportunity for a green transformation. With strong policy support, the PCB plasma desmear equipment sector, known for its high efficiency, energy-saving, and environmentally friendly features, is experiencing favorable conditions and a promising growth outlook.

Future Trends and Opportunities of Global and China’s PCB Plasma Desmear Equipment Industry

Expansion of Advanced Semiconductor and IC Packaging Applications: As semiconductor technology advances, there is an increasing demand for ultra-high-density interconnect PCBs and advanced IC packaging solutions, such as system-in-package. These applications require extreme precision in surface processing, adhesion enhancement, and residue-free cleaning, making plasma desmear a critical step in manufacturing. Additionally, as miniaturization and higher integration levels become industry standards, traditional wet chemical processing’s struggle to meet the requirements for fine-pitch substrates. Plasma technology provides an effective dry processing solution, enabling superior reliability and electrical performance in next-generation semiconductor packaging.

Growth of New Energy Vehicles (NEVs) and Automotive Electronics: The automotive industry is undergoing a transformative shift with the rise of electric vehicles (EVs), autonomous driving, and intelligent cockpit systems. These developments require high-performance PCBs capable of handling high-frequency signals, power management, and harsh environmental conditions. Plasma desmear enhances PCB performance by improving dielectric properties, ensuring better adhesion of conformal

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coatings, and optimizing surface roughness for advanced interconnections. Additionally, with the increased use of millimeter-wave radar and ADAS, the demand for low-loss, high-frequency PCBs is rising, further driving the need for plasma desmear in automotive electronics manufacturing.

Increasing Demand for Flexible and High-Reliability PCBs: The proliferation of foldable devices, wearable electronics, and medical technology has fueled the demand for flexible PCBs and rigid-flex PCBs. These products require highly reliable interconnects, enhanced bonding strength, and precise material modifications, all areas where plasma desmear excels. Plasma desmear is particularly useful in improving adhesion for flexible substrates, removing organic contaminants, and ensuring robust surface energy optimization before lamination or component assembly. Moreover, as devices become thinner and more compact, achieving defect-free PCB surfaces with plasma desmear is critical for ensuring long-term reliability and performance.

Global Supply Chain Diversification and Localization: While China continues to dominate the global PCB market, geopolitical tensions, trade restrictions, and supply chain disruptions are prompting electronics manufacturers to diversify their production bases. Countries such as Vietnam, India, and Mexico are emerging as alternative manufacturing hubs, leading to a wider demand for localized PCB production and related processing equipment. This trend creates significant opportunities for plasma desmear equipment manufacturers to expand their presence in new markets. Additionally, as local governments implement policies to support domestic electronics production, investments in advanced PCB manufacturing technologies, including plasma desmear are expected to increase, further driving innovation and adoption worldwide.

Challenges of Global and China’s PCB Plasma Desmear Equipment Industry

Slow Technological Advancements and Insufficient R&D Investment: The demand for plasma desmear equipment in the PCB industry is primarily driven by the need to improve surface adhesion, cleaning effectiveness, and solderability. Plasma desmear technology involves complex physical and chemical principles, such as gas ionization and reactive gas flow. Therefore, developing such equipment requires significant technical expertise. Due to insufficient R&D investment, especially in small and medium-sized enterprises, many companies struggle to innovate, leaving their products trailing behind cutting-edge technologies, limiting their market competitiveness and expansion.

Impact of High Capital Investment: The PCB plasma desmear equipment industry is capital-intensive, requiring companies to invest significant amounts of money in plant construction, equipment acquisition, material procurement, and the design of complete equipment. Due to the high degree of customization required, PCB plasma desmear equipment companies must produce machines with multiple processes based on customer demands. The long delivery and payment cycles tie up significant working capital, making it difficult for new entrants to enter the industry without substantial financial support.

Lack of Standardization and Industry Regulations: Plasma desmear equipment for PCB manufacturing is widely used across various industries, including telecommunications, automotive, and consumer electronics, each of which has different technical requirements, performance standards, and operating environments. This creates complexity in standardization and regulation. The absence of unified standards across regions and sectors presents a significant challenge for manufacturers. Companies must not only meet the domestic market’s technical and quality requirements but also adapt their products to comply with varying international regulations, which increases both R&D and production costs.

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International Trade Frictions: Due to international trade frictions, the key technologies and equipment of China’s PCB plasma desmear equipment industry have faced significant restrictions in international cooperation and technology imports, creating long-term technological bottlenecks for the industry’s development. The U.S. Overseas Investment Committee is likely to impose stricter regulations and scrutiny on Chinese companies’ investments in equipment related to plasma control technology applications. This will present further challenges for Chinese PCB plasma desmear equipment companies in the international market.

OVERVIEW OF GLOBAL AND CHINA’S SEMICONDUCTOR INDUSTRY

Definition and Classification of Semiconductor Industry

Semiconductors are materials that have electrical conductivity between that of conductors (generally metals) and non-conductors or insulators (such as ceramics). They are the foundation of modern electronics and are commonly referred to as integrated circuits, microchips, or simply “chips.” Containing thousands of miniature electronic components interconnected, semiconductors serve as the brains of modern technology. They power a wide range of devices, from consumer electronics like televisions, laptops, tablets, and mobile phones to advanced systems used in aerospace, business operations, industrial applications, and national defense. As a crucial driver of the digital economy, semiconductors continue to enable technological advancements and innovation. Semiconductors can be broadly categorized into discrete, optoelectronics, sensors and actuators, and integrated circuits (ICs) based on their function and application.

Global Market Size of Semiconductor Industry

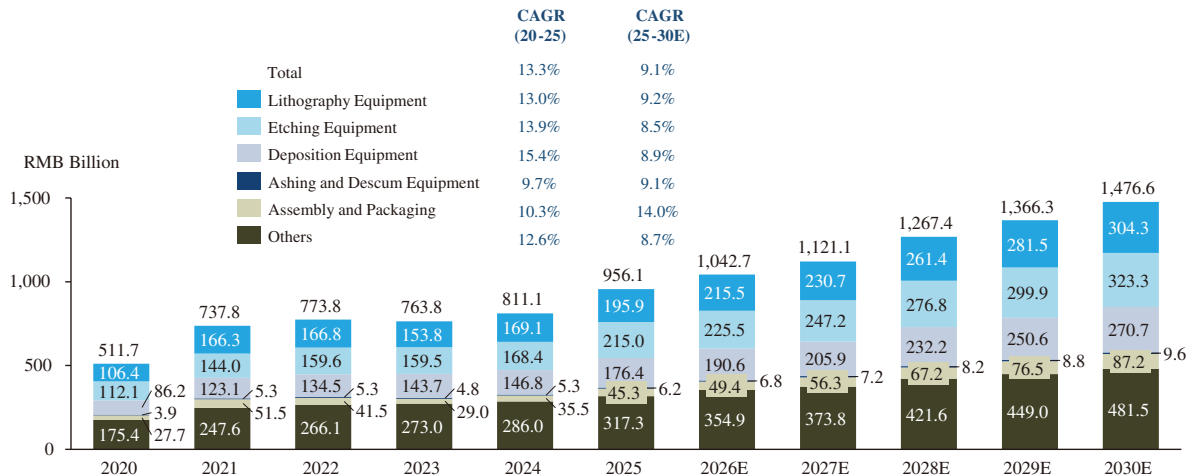
The global semiconductor market has experienced fluctuations over the years due to various economic, technological, and geopolitical factors. The market size of global semiconductor industry increased from RMB3,139.9 billion in 2020 to RMB5,524.5 billion in 2025, representing a CAGR of 12.0% during this period. Looking ahead, the global semiconductor market is expected to grow with a CAGR of 9.1% and reach RMB8,551.6 billion in 2030, the growth will be driven by AI, high-performance computing, and automotive semiconductors.

Global Market Size of Semiconductor Equipment Industry by Products

The global semiconductor equipment industry has experienced steady growth from 2020 to 2025, expanding from RMB511.7 billion in 2020 to RMB956.1 billion in 2025, representing a CAGR of 13.3%. Looking forward, the global semiconductor equipment industry is projected to continue growing at a CAGR of 9.1%, reaching RMB1476.6 billion by 2030.

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Market Size of Semiconductor Equipment Industry (Global), Breakdown by Products, 2020-2030E

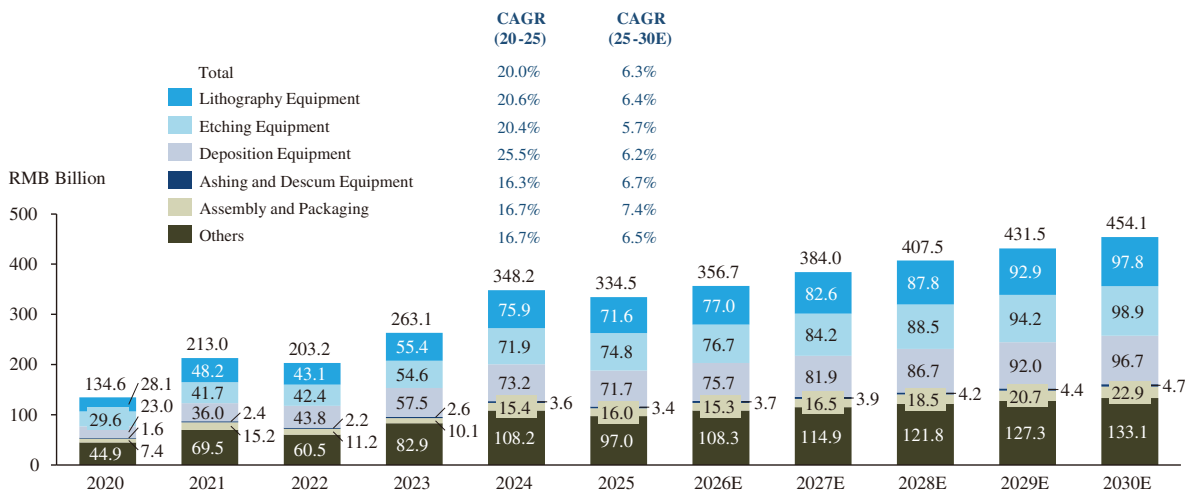


Source: Semiconductor Industry Association, SEMI, Frost & Sullivan Analysis

China's Market Size of Semiconductor Equipment Industry by Products

From 2020 to 2025, the market size of China's semiconductor equipment industry grew from RMB134.6 billion to RMB334.5 billion, representing a CAGR of 20.0%. Looking forward, the Chinese semiconductor equipment market is projected to continue its growth, reaching RMB454.1 billion by 2030, with a CAGR of 6.3% from 2025 to 2030.

Market Size of Semiconductor Equipment Industry (China), Breakdown by Products, 2020-2030E



Source: Semiconductor Industry Association, SEMI, Frost & Sullivan Analysis

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Definition and classification of semiconductor etching equipment

Etching equipment is a critical component in semiconductor fabrication process, used to transfer patterns from photoresist onto thin films. This process allows the creation of intricate, microscopic patterns that define the electrical pathways and components on a chip. Etching can be divided into two main types: wet etching and dry etching (also called plasma etching).

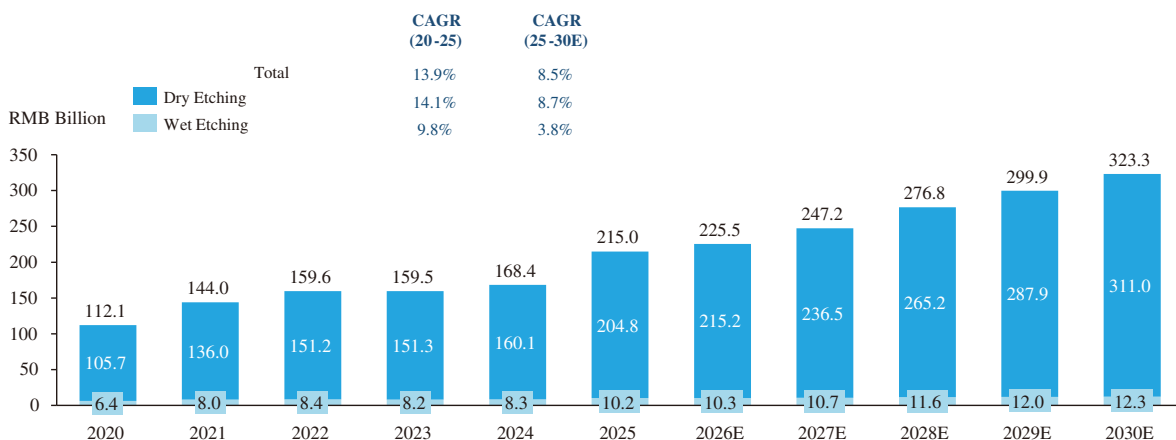
Wet Etching: The process uses liquid chemicals, typically acids or alkalis, to remove the exposed portions of the thin film. The liquid chemicals react with the material to dissolve it, leaving the desired pattern behind. Wet etching is relatively simple and cost-effective, but it can be less precise compared to dry etching, especially for more advanced microfabrication processes.

Dry Etching: Also known as plasma etching, this technique employs gases that are turned into plasma. The plasma reacts with the exposed material, and ions or radicals remove the unwanted portions of the thin film. Dry etching is preferred for more advanced manufacturing due to its ability to produce fine, precise features. It is highly anisotropic, meaning it can etch with high directionality and sharp vertical profiles, which is essential for modern semiconductor fabrication. Dry etching currently dominates the market, accounting for over 90% of the etching processes used in semiconductor manufacturing.

Global market size of semiconductor etching equipment industry by types

From 2020 to 2025, the global dry etching equipment market size grew from RMB105.7 billion to RMB204.8 billion, representing a CAGR of 14.1%, during the same period of time, the global wet etching equipment market size grew at a lower CAGR of 9.8% and reached RMB10.2 billion in 2025. Looking forward, it is anticipated that the global dry etching equipment market will keep steady growth and reach RMB311.0 billion in 2030, representing a CAGR of 8.7% since 2025, while the wet etching equipment market will experience a slower growth rate and reach RMB12.3 billion in 2030.

Market Size of Semiconductor Etching Equipment Industry (Global), Breakdown by Types, 2020-2030E



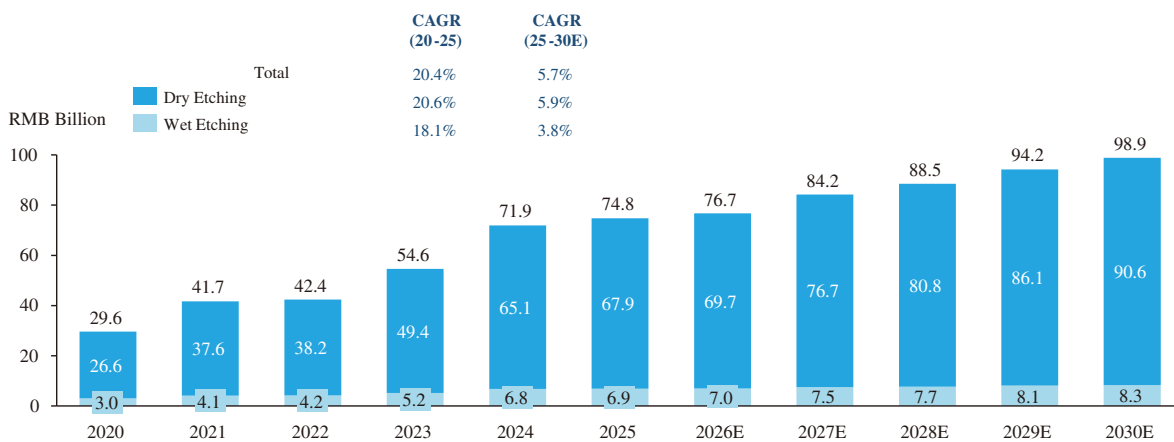
Source: Semiconductor Industry Association, SEMI, Frost & Sullivan Analysis

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China’s market size of semiconductor etching equipment industry by types

From 2020 to 2025, the China’s dry etching equipment market size grew from RMB26.6 billion to RMB67.9 billion, representing a CAGR of 20.6%, during the same period of time, the China’s wet etching equipment market size grew at a lower CAGR of 18.1% and reached RMB6.9 billion in 2025. Looking forward, it is anticipated that the China’s dry etching equipment market will reach RMB90.6 billion in 2030, representing a CAGR of 5.9% since 2025, while the wet etching equipment market will reach RMB8.3 billion in 2030.

Market Size of Semiconductor Etching Equipment Industry (China), Breakdown by Types, 2020-2030E



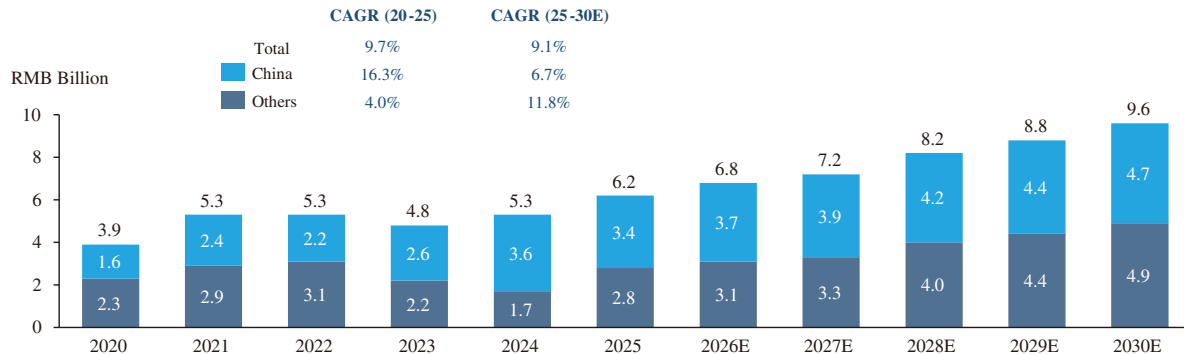
Source: Semiconductor Industry Association, SEMI, Frost & Sullivan Analysis

Global and China’s market size of ashing and descum equipment industry

The market size of global ashing and descum equipment industry increased from RMB3.9 billion in 2020 to RMB6.2 billion in 2025, representing a CAGR of 9.7% during this period. The market is expected to grow with a CAGR of 9.1% and reach RMB9.6 billion in 2030. The market size of China’s ashing and descum equipment industry increased from RMB1.6 billion in 2020 to RMB3.4 billion in 2025, representing a CAGR of 16.3% during this period. The market is expected to grow with a CAGR of 6.7% and reach RMB4.7 billion in 2030.

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Market Size of Ashing and Descum Equipment Industry (Global and China), 2020-2030E

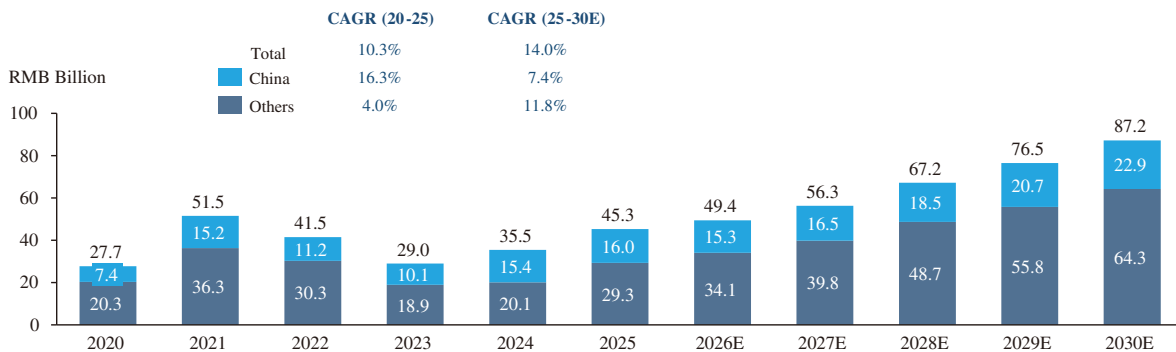


Source: Semiconductor Industry Association, SEMI, Frost & Sullivan Analysis

Global and China’s market size of assembly and packaging equipment industry

The market size of global assembly and packaging equipment industry increased from RMB27.7 billion in 2020 to RMB45.3 billion in 2025, representing a CAGR of 10.3% during this period. The market is expected to grow with a CAGR of 14.0% and reach RMB87.2 billion in 2030. The market size of China’s assembly and packaging equipment industry increased from RMB7.4 billion in 2020 to RMB16.0 billion in 2025, representing a CAGR of 16.3% during this period. The market is expected to grow with a CAGR of 7.4% and reach RMB22.9 billion in 2030.

Market Size of Assembly and Packaging Equipment Industry (Global and China), 2020-2030E



Source: SEMI, Frost & Sullivan Analysis

Market Drivers and Future Trends of Global and China’s Semiconductor Equipment Industry

Advanced Nodes Driving Higher Equipment Requirements: As semiconductor manufacturing advances beyond 7nm and 5nm nodes, chipmakers require more precise and sophisticated equipment to meet the increasing complexity of chip fabrication. This growing complexity is driving strong demand for high-performance semiconductor equipment, creating opportunities for equipment suppliers.

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Stricter Export Controls Fueling Domestic Self-Sufficiency: With tightening export restrictions from major semiconductor technology suppliers, China’s semiconductor industry is accelerating efforts toward self-sufficiency. As the U.S. imposed tighter export restrictions on advanced semiconductor technology, China has significantly increased investment in semiconductor equipment to mitigate the risks of supply chain disruptions. As a result, China is prioritizing investment in local semiconductor equipment manufacturers, particularly in key areas such as etching, deposition, and lithography, to reduce reliance on foreign suppliers and ensure long-term industrial resilience.

Increasing Demand from New Wafer Fab: China is at the forefront of global wafer fab expansion, with multiple semiconductor manufacturing projects underway. As domestic wafer fabs ramp up production capacity, the demand for semiconductor equipment, which including etching, deposition, and testing tools, is expected to increase. With the increasing number of fabs focusing on both mature and advanced process nodes, the semiconductor equipment market in China is poised for sustained growth.

Challenges of Global and China’s Semiconductor Equipment Industry

Technological Gaps in High-End Equipment: Despite significant progress in domestic semiconductor equipment manufacturing, China still faces challenges in bridging the technological gap in high-end equipment, particularly in areas such as lithography, advanced etching, deposition. In these areas, Chinese manufacturers are still lagging behind leading international companies, who have the technological edge in providing equipment capable of supporting these cutting-edge processes.

Weak Domestic Supply Chain for Critical Core Components: One of the key challenges for China’s semiconductor equipment industry is the weak domestic supply chain for critical core components. Many essential parts for high-end equipment, such as radio frequency generators and specialized optics, are still heavily reliant on imports. This dependence on foreign suppliers for core components limits the ability of domestic manufacturers to achieve full localization and poses risks in terms of supply chain security and cost competitiveness.

COMPETITIVE LANDSCAPE

Competitive Landscape of China’s Plasma Processing Equipment Market

In 2025, the number of market players in China plasma processing equipment industry is more than 50. The plasma processing equipment market in China market is relatively concentrated with top five players taking 72.3% market in 2025 in terms of revenue. The Company had a market share of less than 0.01% in China plasma processing equipment market in terms of revenue in 2025.

Competitive Landscape of China’s PCB Plasma Desmear Equipment Market

In 2025, the number of market players in China’s PCB plasma desmear equipment industry is more than 30. The PCB plasma desmear equipment market in China market is relatively fragmented with top 3 players took 13.0% market in 2025 in terms of revenue. The Company ranked third in China PCB plasma desmear equipment market in 2025, with a market share of 3.6% in terms of revenue generated from China. Moreover, from 2023 to 2025, the Company ranked among the top 3 players in China PCB plasma desmear equipment market in terms of revenue generated from China.

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Top 3 PCB Plasma Desmear Equipment Company by Revenue (China), 2025

Rank	Company	Identities or Background	Revenue (RMB million) 2025	Market Share (%) 2025
1	Company A	<i>Established in 1954, Company A is a listed company on NASDAQ. Headquartered in Amherst, Ohio, this company mainly engineer, manufacture and market differentiated products used for dispensing adhesives, coatings, sealants, biomaterials and other materials; for fluid management; for test and inspection; and for UV curing and plasma surface treatment.</i>	63.8	4.9%
2	Company B	<i>Established in 2016, Company B is a non-public company. Headquartered in Zhuhai, this company mainly offers R&D, production and sales of electromechanical equipment, circuit boards, semiconductors.</i>	58.6	4.5%
3	The Company	/	46.8	3.6%
Top 3 Subtotal			169.2	13.0%
Others			1,130.8	87.0%
Total			1,300.0	100.0%

Source: Frost & Sullivan Analysis

Competitive Landscape of China’s Semiconductor Plasma Processing Equipment Market

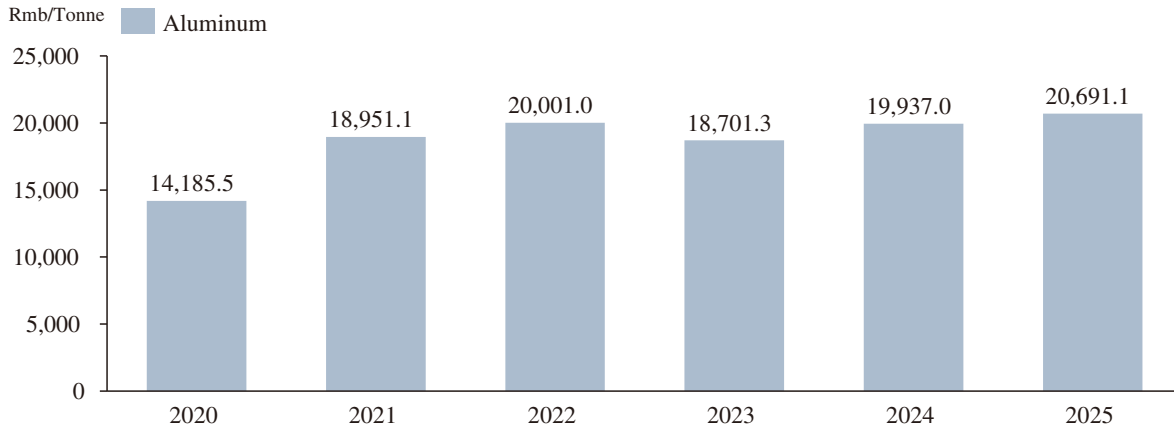
In 2025, the number of market players in China’s semiconductor plasma processing industry is more than 20. The semiconductor plasma processing market in China market is relatively concentrated with top 5 players took 92.9% market in 2024 in terms of revenue. The Company had a market share of 0.01% in China’s semiconductor plasma processing market in terms of revenue in 2025.

Cost Analysis

The major raw material used in the production of plasma processing equipment include aluminum, comprise vacuum pumps, IFP power supplies, plasma nozzles, and automated robotic systems. With the exception of aluminum, other manufactured items are custom-engineered solutions that do not adhere to standardized pricing structures due to their bespoke nature. The price of aluminum fluctuated from 2020 to 2025. The price of aluminum increased from RMB14,185.5 per tonne in 2020 to RMB18,951.1 per tonne in 2021 as a result of imbalance of supply and demand. The price further increased to RMB20,001.0 per tonne in 2022, mainly due to production disruptions caused by power restrictions. In 2023, The price of aluminum experienced decrease in 2023, reaching RMB18,701.3 per tonne, driven by factors including low smelting cost of electrolytic aluminum and excessive aluminum material stocks. With reduced inventory pressures, development of new energy industry and limited supply of bauxite, the aluminum price has experienced a recovery, reaching RMB20,691.1 per tonne in 2025.

INDUSTRY OVERVIEW

Prices of Raw Materials for Plasma Processing Equipment, 2020-2025



Source: Frost & Sullivan Analysis

SOURCE INFORMATION AND RESEARCH METHODOLOGY

We have commissioned Frost & Sullivan, a market research and consulting company and an independent third party, to conduct an analysis of, and to report on global and China plasma processing equipment market. The report prepared by Frost & Sullivan for us is referred to in the document as the F&S Report. The F&S Report has been prepared by Frost & Sullivan independent of our influence. The fee payable to Frost & Sullivan for preparing the F&S Report is RMB400,000 which we believe reflects market rates for similar services. Founded in 1961, Frost & Sullivan has over 45 global offices with more than 3,000 industry consultants, market research analysts, technology analysts and economists. Our Directors confirm, to the best of their knowledge, and after making reasonable enquiries, that there have been no adverse changes in the industry since the date of the F&S report and up to the Latest Practicable Date which may qualify, contradict or have an impact on the information set out in this section.

During the preparation of the F&S Report, Frost & Sullivan collected, analysed, assessed and validated the information and statistics using its in-house analysis models and techniques. Primary research was conducted via discussions and interviews with industry participants and industry experts. Secondary research involved analysis of market statistics obtained from several publicly available data sources, such as releases from the governments of the research countries, company reports, independent research reports and Frost & Sullivan’s own internal database. The methodology applied by Frost & Sullivan is based on information and statistics gathered from multiple levels and allows such information and statistics to be cross-referenced for accuracy. In light of the above, we consider the information and statistics reliable.

BASIS AND ASSUMPTION

The F&S Report contains a series of market projections which were produced based on the following assumptions, without limitations: (i) China’s and global economy is likely to maintain steady growth in the next decade; (ii) China’s and global social, economic, and political environment is likely to remain stable from 2026 to 2030 (“**Forecast Period**”).