

Huge Market Potential for Semiconductor Devices: Relevant Companies Seize Micro-Machining Opportunities

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HONG KONG, CHINA, August 11, 2023 /EINPresswire.com/ -- "There have been only two industrial revolutions in human history. The first was the era of mechanization, and the second is the era of digital intelligence. We are currently at the climax of the second industrial revolution, and the 'superhuman era' is about to arrive," "This is a global industry, and it's impossible to develop in isolation," "The more the industry is in a downturn, the more we need to increase investment"... On August 9-11, the 11th Annual Conference and Industry Chain Cooperation Forum of the China Electronic Special Equipment Industry Association was held in Wuxi, China. Leaders of several listed [semiconductor](#) companies expressed their views on the development of the semiconductor industry.

[Jak electronics](#) believes that in the era of intelligence, semiconductors are the core foundation. The demand for semiconductors has catalyzed the micro-device industry based on micro-processing, namely, the semiconductor equipment industry. China has become the largest market for the global semiconductor industry, but there are obvious shortfalls in equipment and consumables, which also means there is a huge space for growth. Leaders of several semiconductor companies, including China Micro Corporation, Tuojing Technology, Fuchuang Precision, and Kaishitong (a subsidiary of Wanye Enterprises), have expressed that they will face challenges and seize opportunities.

Broad Prospects for Micro-Machining

The chairman and CEO of China Micro Corporation, Yin Zhiyao, redefined the industrial revolution in his keynote speech. According to Yin, an industrial revolution is defined by a fundamental change in manufacturing. Developing a significant product that brings great changes in a certain period cannot be considered an industrial revolution.

Yin believes that the first industrial revolution was the era of mechanization, which replaced manual labor with machinery and gave rise to the traditional industry centered on macro-processing. The second industrial revolution is the era of digital intelligence, replacing the human brain with computers and human senses with micro-devices, and giving birth to the micro-device

industry centered on micro-machining.

"We are currently at the climax of the second industrial revolution, by 2035 the output value of the digital industry will exceed 50% of the total output value of global enterprises." Yin Zhiyao stated that in the era of digital intelligence, semiconductor micro-machining equipment is the cornerstone of the digital industry and is also the pioneer and commanding height.

Micro-materials include chemical thin films, physical thin films, single-crystal EPI (epitaxy), etc., and micro-machining processes include photolithography, plasma etching, CMP (Chemical Mechanical Polishing), etc. This has given birth to a series of semiconductor micro-machining equipment such as thin film equipment, epitaxial equipment, photolithography machines, plasma etching machines, CMP, etc.

"The importance of the supply chain link such as semiconductor equipment, materials, and components is highlighted with the increased investment in domestic wafer fabs." Li Hong, executive director and president of Huachuang Micro, said that in 2022, the global semiconductor industry sales were \$574.1 billion, and China's semiconductor industry reached \$185.5 billion, accounting for about 32%. China has become the largest market for the global semiconductor industry, but there is an obvious shortfall in equipment and consumables, which also means there is a huge space for growth.

"We can also do a good job in the micro-device processing industry." Yin Zhiyao emphasized. The data he provided showed that 11 types of semiconductor equipment, including CCP plasma etching machine, ICP plasma etching machine, PECVD equipment, LPCVD equipment, ALD equipment, PVD equipment, CMP equipment, ECP equipment, optical detection equipment, electron beam detection equipment, MOCVD, were all developed by Chinese students studying abroad as the leaders or backbones.

"In the next 50 to 100 years, humans will enter the third industrial revolution, the 'superhuman era'." Yin Zhiyao believes that from the era of intelligence to the "superhuman era", with superhumans replacing humans, it will give birth to the electronic life industry integrated with life science/data technology.

"Innovation-driven, technological evolution, application traction." Looking back at the driving force for the development of the semiconductor industry, Li Hong, Executive Director and President of Huachuang Micro, stated that since 1994, the global semiconductor market sales have fluctuated, but the overall trend has been upward, and it is expected to exceed one trillion dollars by 2030.

Li Hong believes that the global semiconductor industry has seen a quarter-on-quarter decline since the second quarter of 2022, and signs of a quarter-on-quarter increase have emerged in the second quarter of this year. It is expected that the current cycle of the industry is at the bottoming stage. Observing factors such as demand recovery and inventory digestion pace, the

industry is expected to achieve quarter-on-quarter growth in the fourth quarter of this year.

With the new round of industry cycle upturn, semiconductor equipment materials parts will face a larger market size and new challenges.

Li Jinxiong, Deputy Secretary-General of the China Electronics Special Equipment Industry Association, Director and Chief Engineer of Huada Semiconductor Co., Ltd., and Shanghai Jituo Semiconductor Co., Ltd., introduced that at present, there are still several bottlenecks for local equipment to enter large production lines: First, equipment cannot be provided and is blank, such as lithography, measurement, failure analysis and other equipment; Second, existing equipment does not meet special process requirements, such as special material growth and removal equipment; Third, both equipment and processes can be provided, but the maturity of key processes is not enough, affecting the yield of wafer fabs.

At the 2023 Semiconductor Manufacturing Technology and Equipment Materials Chairman's Forum held simultaneously on the day, the chairmen of several listed semiconductor equipment companies stated that they will seize opportunities and accelerate development.

"This is a global industry, and it is impossible to develop behind closed doors." Lu Guangquan, chairman of Tuoqing Technology, emphasized that the semiconductor equipment industry must be open and cooperative. Noticing the new process needs of the post-Moore era such as Chiplet, Tuoqing Technology has developed two hybrid bonding devices, including wafer-to-wafer bonding products and chip-to-wafer bonding surface pretreatment products, mainly used in the field of wafer-level three-dimensional integration.

As a domestic semiconductor equipment parts platform company, Zheng Guangwen, chairman of Fuchuang Precision, emphasized that the more the industry is in a downturn, the more investment should be increased and the recruitment of excellent talents should be accelerated. Facing challenges, Li Yongjun, chairman of Kaishitong, said that to survive and live well, innovation must be intensified.

Li Hong stated that Huachuang Micro fully utilizes the vertical integration advantage of the IDM business model, actively supports the verification of local equipment and materials, and drives the development of the upstream and downstream of the industry chain.

JAK Electronics
JAK Electronics
+852 91409462
[email us here](#)

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