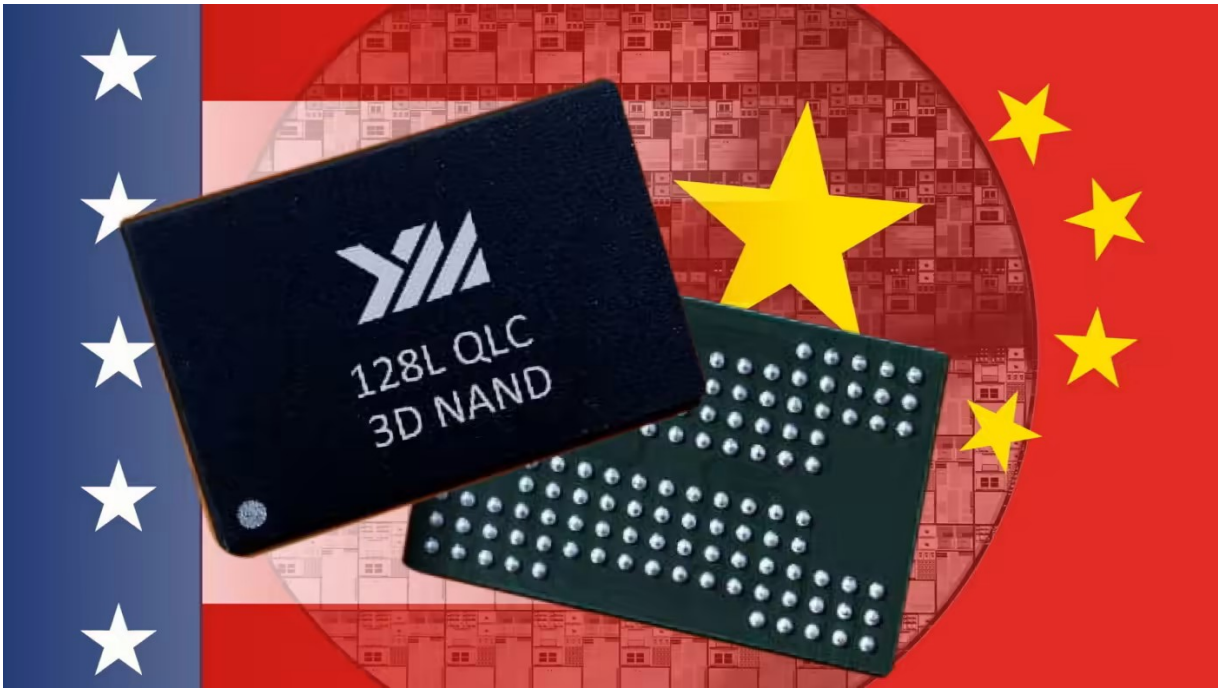
Semiconductors

China's chip equipment makers struggle to profit at home from US export controls

Orders rise in short term, but domestic suppliers lag in supporting advanced semiconductor technology



China's largest memory chip maker YMTC says it will order tools from local suppliers in the face of US sanctions, but it will still have to look abroad for more advanced equipment © FT montage

Qianer Liu in Hong Kong and **Kathrin Hille** in Taipei 9 HOURS AGO

As US export controls bite, Chinese manufacturers of equipment needed to make semiconductors are expected to benefit from a rush of domestic orders, though executives and analysts warn the boost could be shortlived.

Since Washington introduced sweeping restrictions on October 7 to limit Chinese companies' ability to obtain or manufacture advanced computer chips, Yangtze Memory Technology, China's largest memory chip maker, has issued at least 20 tenders for a broad range of chipmaking equipment.

"The current strategy is that if there is workable domestic semiconductor production equipment, even though [the suppliers] need help, we will buy from Chinese companies. If not, we shop from non-US vendors, mostly Japanese," said a senior YMTC engineer.

"I anticipate most of the orders would end up in the hands of domestic suppliers who would prioritise clients like us, but there are still quite a few pieces beyond their capability," the person said.

The company will instead replace US toolmakers such as KLA and Applied Materials with Japanese ones, including Hitachi and Tokyo Electron, in a sign of how homegrown suppliers still lag foreign rivals with their technology.

To make matters worse, Chinese chipmakers' loss of access to certain irreplaceable US-made tools has halted the majority of construction projects for production facilities that drive domestic equipment makers' business.

Chinese semiconductor equipment revenues tripled between 2018 and 2021, driven by domestic chipmakers' aggressive expansion, according to research by Sanford C. Bernstein. But the investment group estimates a mere 15 per cent of equipment demand from Chinese chipmakers was covered by homegrown suppliers this year, far short of an ambitious government target of 30 per cent.

The export controls will hold this crucial sector back even more, analysts said. "They may want to step up self-sufficiency in terms of chip manufacturing equipment in reaction to the export controls, but in fact, localisation will be slower as a result of the controls," said Mark Li, semiconductor analyst at Sanford C. Bernstein in Hong Kong. "The biggest bottleneck is that their customers, because of lack of access to foreign equipment, will be unable to expand more."

Three people with direct knowledge of the situation said that while YMTC has not cancelled or postponed already placed equipment orders, the company's plans to expand are suspended. ChangXin Memory Technologies, YMTC's smaller rival, has also put some expansion plans on hold, according to one person familiar with the matter.

Analysts at Jefferies predict this disruption to the capital spending plans of Chinese chipmakers, especially in the memory segment, will lead to a dramatic drop in demand for semiconductor production equipment over the next few years.

YMTC and CXMT should still have enough equipment to meet their expansion plans next year, but "if they cannot access advanced equipment from the US and cannot find good enough alternatives from Japanese or European suppliers, they will probably have to stop expansion entirely", Jefferies analyst Nick Cheng wrote in a research note. As a result, China's total investment in chipmaking tools would drop from the analyst's previously forecast $26bn to $18bn in 2024, and from $24bn to $16bn in 2025.

That would rob Advanced Micro-Fabrication Equipment, one of China's largest chip equipment makers, of a quarter of Jefferies's forecast revenue for 2025. ACM Research, an AMEC rival, would lose nearly 20 per cent of projected revenue for that year, the note predicted.

The chip companies did not respond to a request for official comment.

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Despite stockpiling efforts, several equipment companies could also be hit by the inability to procure foreign components for their products.

"Only the assembly part of our products is completely based in China, while the rest requires foreign technology and components . . . just limitations on components can easily choke us," said a senior engineer at AMEC.

In addition, the equipment makers are facing a talent drain as engineers seek higher-paying jobs in chip design houses and semiconductor manufacturers.

"Chinese equipment companies should also worry about the stability of their existing R&D team as we have received quite a lot of inquiries from equipment engineers regarding switching to other sectors that have not been affected as much by the new sanctions," said a Shanghai-based headhunter.

In the face of the mounting challenges, the response from some equipment companies is to explore greater collaboration with their rivals.

"The new sanctions are forcing companies like us to seek further co-operation with each other," said an AMEC manager. "Executives from several companies, including ACMR, AMEC and others, are breaking walls and have had meetings on this."