



1988

Coater/developer

~ Discrete Semiconductor/Others ~

The photolithography was processed in the order of (1) photoresist coating, (2) pre-bake, (3) exposure, (4) development, (5) post-bake, and (6) UV cure. The apparatus included a spinner for coating and developing a photoresist, a pre-post bake furnace, and an ultraviolet irradiation device for UV cure. These devices were commercialized by the GCA in the 1960s. In the 1970s, these individual processing apparatus were linked and wafers were conveyed by belt for continuous processing⁽¹⁾.

Tokyo Electron introduced the CLEAN TRACK (MARK V) in 1988, in which the belt conveyor system was replaced by a robot arm transfer system. The multi-stage processing chamber was adapted to achieve high throughput and space saving^[2]. Chemically amplified photoresists were used for lithography in the 1990s. The photoresist coating and development processes became more complex and required for precise control. This system, in which various processing chambers were set up in multiple stages and wafers were transferred at high speed by robotic arms, became the standard for clean tracks. This type of clean track was also used to coat low-k dielectric films for multilayer interconnections in the 1990s.

References:

【1】 Chip History, Organization, “TEL Clean Track Mark II”

<https://www.chiphistory.org/272-tel-clean-track-mark-ii>

【2】 Semiconductor History Museum, Stories of Development Challenges, SEMI-Japan, “Coater-Developer (MARK-V)” (Japanese)

https://www.semi.org/sites/semi.org/files/docs/Kaihatsuhiwa_2003%235_TEL.pdf

Version 2022/5/28