

The transport strategies for fully automated manufacturing in 300 mm wafer fab

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Abstract

This paper addresses the operational issues of transport strategies in tool and vehicle dispatching integration (TVDI) architecture in a fully automated manufacturing wafer fab. At present, there are three transport strategies involved in vehicle dispatching, namely, avoid blocking, avoid starvation, and accelerate batch preparation. These strategies were developed to obviate production obstacles and to avoid capacity loss. Consequently, there are five levels in the decision-making process of TVDI, namely, dispatching request, conditions checking, candidate selection, dispatching rules, and result execution. Specifically, candidate selection was classified into five categories: FOUP-selects-tool (FST), FOUP-selects-stocker (FSS), tool-selects-FOUP (TSF), FOUP-selects-vehicle (FSV), and vehicle-selects-FOUP (VSF). The proposed transport strategies were implemented in VSF, and a simulation model abstracted from a wafer fab in Taiwan was used to evaluate the performance. The results show that the differences in the proposed strategies compared with ignoring the issues are statistically significant, and the performances of the wafer output, cycle time and waiting time can be improved.

Keyword : dispatching; integration; transport; AMHS; wafer fab; simulation