

A capacity planning model for stockers in 300mm wafer fabrication factory

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### Abstract

Automatic Material Handling System (AMHS) is becoming more important in 300 mm wafer fabrication factories. Effective and efficient design and control of AMHS has become more critical particularly in capacity planning of stockers. It will be extravagant in the space of clean room if the capacity of stockers is surplus. Nevertheless, when the capacity of stockers is insufficient, the production activities will be a chaos. Therefore, how to determine an adequate capacity level of each stocker to keep the production activities smooth is a key factor in 300mm fab. In this study a capacity determination model of stocker is proposed. There are two portions, IS (In Storage) and OS (Out Storage), included in each stocker. In Storage is to store the lots to wait for processing by the equipment within it's own bay. Out Storage is the temporary storage to keep the lots which wait for OHS (Overhead Hoist System) to send to the stocker in other bay. GI/G/m queuing network is applied to calculate the capacity of IS. Besides, the equipment behaviors and confidence level will be taken into account to increase the estimation accuracy of capacity requirement. Regarding to OS, due to high stability of OHS, a single and simple GI/G/m queuing model is established to estimate the queue length waiting for OHS. Finally, each stocker capacity can be determined as the combination of the capacity of IS and OS.

Keyword : Wafer fabrication, Stocker, Capacity Planning, Queuing model