Capacity Backup Model for Twin Fabs of Wafer Fabrication

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Abstract

The twin-fab concept has been established over the past decade due to the considerations of cheaper facility build up, faster equipment move in and more flexible productivity management. However, if lacking of completed backup control policies, the benefit of twin-fab will be decreased significantly particularly in production flexibility as well as effectiveness.
In this work, the control policy of capacity backup was established that two control thresholds were developed. The first one is the WIP (Working In Process) amount threshold which is the trigger for backup action. Nonetheless, the concept of protective capacity is also applied to set this threshold. When the WIP level in front of the workstation which needs capacity support is over the threshold, the action of capacity support is triggered. In order to endorse the effectiveness of WIP transfer between twin-fab, the threshold of WIP amount difference (D) is set as a control gate. When the WIP level in front of the workstation which needs capacity support is over the threshold and the difference of WIP amount in the twin fabs is over than D, the coming WIP will be transferred to the other fab. The design of the threshold of WIP amount difference is based on the concept of the coverage of transportation time and the benefit should be got when backup action is occurred. Through these two control rules, WIP can be well arranged among the twin fabs and be processed more efficiently and effectively. Finally, the production performances of twin fabs will be improved under the capacity backup policy.

Keyword：Twin-fab, Capacity backup policy, Protective capacity, Transportation time