Model to Evaluate Production Performance of Twin-Fab under Capacity Support

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Abstract

Semiconductor manufacturing is a capital-intensive and high-tech industry. In order to reduce installation cost and increase production flexibility, twin-fab concept has been established over the past decade, which means two neighboring fabs can be connected to each other by automatic transportation system (AMHS). The capacity backup can be performed between twin fabs to increase whole performance. In this work, a performance evaluation model is proposed to estimate the whole production performance of twin fabs under backup policy. Two situations of capacity shortage are discussed, temporary and permanent capacity shortage. The queuing theory and Little's Law are used in this model. Besides, the expected value is applied for the estimation of the transportation time under backup activities. Based on the evaluation model, managers can obtain an appropriate estimation of performance under capacity backup in twin-fab environment, which will help to get the reliable information for decision making.

Keyword：Twin-fab, Performance evaluation, Capacity backup