Study on Sample product and Mass product scheduling problem with Parallel-Machine in Semiconductor industory

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ABSTRACT

Semi-conductor manufacturing is a very complicated process. Due to the complicated nature of substrate processing and associated production issues, scheduling can be difficult. For production people, planned production often differs from actual production. For the enterprise, the biggest challenge is how to plan a reasonable production plan in order to meet customer requirements.

This research is focused on scheduling improvements at an open short test station at a semiconductor manufacturer, referred to here as Company A. The existing scheduling method at Company A is FCFS (First Come First Serve). There are two main product types: sample products and mass products. Company A values sample products more highly than mass products. In order to survive in a highly competitive environment, Company A must continually improve its processing techniques and enhance system performance, while keeping costs down. These are the prevailing market conditions with which Company A is grappling.

A better scheduling method could reduce the WIP (Work in Process), reduce costs, and maintain promised shipment dates to meet customer requirements. To improve scheduling at Company A, I developed a new method called G scheduling that can reduce the delay in sample product manufacturing. In order to handle both sample products and important mass products, I created another method called G1 scheduling. This research uses a case-study approach to examine the production process of one semiconductor company. Current (FCFS) and theoretical scheduling methods (EDD, SPT, and LPT) are compared to the aforementioned G and G1 scheduling methods to determine which methods might best fulfill the needs of Company A. This research shows that it would be best for Company A to implement the G scheduling method for sample products and the G1 scheduling method for urgent products. This would allow Company A to save money and satisfy their customers, thereby improving their position in the marketplace.

Keyword: Sample product、Mass product、Mass hot product、Sample hot product