

The application of dynamic programming to control wafers inventory problem

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### Abstract

In the field of production and operations management, inventory problem has always been considered as an important topic. This paper studies the control wafers inventory problem in wafer fabrication factories. A single-period, multi-product inventory problem with reentry and downward substitution is examined in a pulling control production environment. The control wafers inventory problem is firstly constructed as a network, and a dynamic programming is applied next to solve the problem. The objective is to set an acceptable inventory level to minimize the total cost of control wafers through reducing various types of costs without halting production throughput. A numerical example is given to illustrate the practicality of the model. The results demonstrate that the proposed model is an effective tool for determining the inventory level of control wafers for each grade.

Keyword : control wafers, single-period, multi-product inventory, pulling, network, dynamic programming.