The application of dynamic programming to control wafers inventory problem

He-Yau Kang¹, Chun-Mei Lai², Amy H. I. Lee³* and Nai-Hua Chen⁴

¹Department of Industrial Engineering and Management, National Chin-Yi University of Technology 35 Lane 215, Sec. 1, Chung San Rd., Taiping, Taichung 411, Taiwan, ROC.
²Department of Marketing and Logistics Management, Far East University, No.49, Zhonghua Rd., Xinshi Dist., Tainan City 744, Taiwan, ROC.
³Department of Technology Management, Chung Hua University, No.707, Sec. 2, WuFu Rd., Hsinchu 300, Taiwan, ROC
⁴Department of Information Management, Chienkuo Technology University No. 1, Chieh Shou N. Rd., Changhua City 500, Taiwan, R.O.C.

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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 was examined in a pulling control production environment. The control wafers inventory problem is firstly constructed as a network, and latter 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.

Key words: Control wafers, single-period, multi-product inventory, pulling, network, dynamic programming.