Just-in-Time Applications in the Economic Lot Scheduling Problem

문일경 (부산대학교 산업공학과)

In this paper we study how Just-in-time (JIT) philosophy can be applied to the Economic Lot Scheduling Problem (ELSP). First, we consider lowly-utilized facilities that idle frequently. Recently researchers have focused on the idea of reducing production rates deliberately which is in accord with the JIT philosophy. We consider the case where production rates can be changed during the prodution runs. We optimally partition the items into those with high and low holding costs. The former are initially produced to meet demand while the latter are always produced at their maximum rates. Numerical examples indicate savings almost twice as large as those reported in the literature.

Setup times and setup costs are known constants in the traditional ELSP. However, setup times can be reduced in some manufacturing situations. We consider a model in which setup times can be reduced at a cost. The reason that we want to reduce setup times at the expense of cost is to produce lots in smaller sizes which is in accord with the JIT strategy. We model setup cost as the sum of the out-of-pocket costs of all setup operations both internal(setup operations which are done while the facility is stopped) and external(setup operations which are done while the facility is operating), and consider the economic effect of externalizing internal setup operations. Computational results indicate that dramatic savings are possible for highly-utilized facilities.