URN etd-0407109-183718-1434
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Statistics This thesis had been viewed 41 times. Download 17 times.
Department
Year 2005
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Optimum Process Mean Setting For A Multi-stage Serial Production System Under Considering Quality Loss Function
Date of Defense 0000-00-00
Page Count 91
Keyword
Quality Loss Function
Process Mean
Specification Limits
Target Value
Multi-stage Serial Production System

Abstract
From the viewpoint of the company, quality is the primary factor that obtains growth and competition. Hence, the optimum process parameters setting is an important method for increasing the market share and maximizing the profit of product. In this study, the author proposes the modified Bowling et al.'s model by considering the quality loss within the specification limits. There are three modified models considered as follows: (1) the quality loss occurs when the quality characteristic of the finished product is within the specification limits and the product characteristic is a normal distribution; (2) the quality loss occurs when the quality characteristic of the finished product is within the specification limits and the product characteristic is a beta distribution; (3) the quality loss occurs when the quality characteristic of the work-in-process product and the finished product are within the specification limits and the product characteristic is a multivariate normal distribution. The linear asymmetric, quadratic symmetric and quadratic asymmetric quality loss functions are used for evaluating the product quality. The purpose of this study is to present three modified Bowling et al.'s models for determining the optimum process mean based on maximizing the expected profit per unit under a multi-stage serial production system. The numerical examples and the sensitivity analyses of parameters are provided for illustration.
Advisory Committee Chen Chung-Ho - advisor

Files etd-0407109-183718-1434-001.pdf

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Date of Submission 2006-06-30