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Economic production quantity model for deteriorating inventory with random machine unavailability and shortage

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Abstract

Both random machine unavailability and shortage are common occurrences in manufacturing industries. In this paper, machine unavailability is considered in deriving an economic production quantity (EPQ) model for deteriorating items. We develop four EPQ models for deteriorating inventory with random machine unavailability and shortage. The study considers lost sales, backorder and two kinds of machine unavailability distributions. Numerical examples are provided to illustrate the theory. Key parameter changes that affect costs are shown in the sensitivity analysis. From the results of the sensitivity analysis, it is shown that the random machine unavailability parameter and holding cost have significant effects on the optimal total cost and production down-time.

Keywords:

EPQ deteriorating item machine unavailability shortage

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