

# **Economic Production Lot-Sizing For An Unreliable Machine Under Imperfect Age-Based Maintenance Policy**

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**ELSEVIER SCIENCE BV, EUROPEAN JOURNAL OF OPERATIONAL RESEARCH; pp:  
150-163; Vol: 186**

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## **Summary**

This paper is concerned with the joint determination of both economic production quantity and preventive maintenance (PM) schedules under the realistic assumption that the production facility is subject to random failure and the maintenance is imperfect. The manufacturing system is assumed to deteriorate while in operation, with an increasing failure rate. The system undergoes PM either upon failure or after having reached a predetermined age, whichever of them occurs first. As is often the case in real manufacturing applications, maintenance activities are imperfect and unable to restore the system to its original healthy state. In this work, we propose a model that could be used to determine the optimal number of production runs and the sequence of PM schedules that minimizes the long-term average cost. Some useful properties of the cost function are developed to characterize the optimal policy. An algorithm is also proposed to find the optimal solutions to the problem at hand. Numerical results are provided to illustrate both the use of the algorithm in the study of the optimal cost function and the latter's sensitivity to different changes in cost factors. (c) 2007 Elsevier B.V. All rights reserved.

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