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Lot Heterogeneity in Statistical Quality Control: An enhanced Optimization Approach for the Design of Rectifying Sampling Plans

In rectifying sampling inspection, a lot is subjected to full inspection if the number of defects in a random sample exceeds a predefined acceptance criterion. Traditional models assume a constant probability of being defective p for all items within a lot. In contrast to this, we consider heterogeneous lots in which individual items can have different probabilities of being defective, to better reflect practical situations such as when items are produced on different machines or handled by different operators. Moreover, the discussed model accounts for possible dependencies among the individual defect probabilities by incorporating correlations. We analyze the key performance metrics, Average Outgoing Quality (AOQ) and Average Total Inspection (ATI), in heterogeneous settings and under different correlation scenarios. Based on the findings, we propose an enhanced optimization approach for the design of rectifying sampling plans.

Special/ Invited session

Classification

Mainly methodology

Keywords

Rectifying sampling inspection, Heterogeneous lots, Sampling plan design

Primary author: BOJER, Jaqueline (University of Graz)

Co-authors: Dr LEWITSCHNIG, Horst (Infineon Technologies Austria AG); HOFER, Vera (University of Graz)

Presenter: BOJER, Jaqueline (University of Graz)

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