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Optimal Sampling Strategy of Incoming Quality Control in In-Mold Decoration Manufacturing

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Abstract

In In-Mold decoration (IMD) manufacturing, when raw materials are delivered to factories, Incoming Quality Control (IQC) is conducted to decide on the acceptance of the raw materials. When the sample size is large, most of the problematic raw materials can be detected, reducing the unnecessary manufacturing cost. The price to pay, however, is increased sampling cost. The trade-off is nontrivial. In this paper, we develop a mathematical model to characterize the problem. Based on the mathematical model, we derive an optimal sampling strategy that can achieve the overall minimum cost, including sampling cost and manufacturing cost put on the problematic raw materials. An empirical study is conducted to verify the viability of the proposed model in real settings. In this empirical study, the model can help the factory to save total cost on Incoming Quality Control.

Keywords
In-Mold decoration (IMD) manufacturing, Incoming Quality Control (IQC), Sampling strategy

Biography

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