

**EFFECTIVENESS OF INTRODUCING HIGH EFFICIENT MOTORS IN  
TEA PROCESSING MACHINERIES**

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by  
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## ABSTRACT

Most of the machinery used in withering and rolling processes in about 700 working tea factories in Sri Lanka are coupled with induction motors working with less than 80% efficiency. These machinery are operated for long hours and they consume about 70% of total energy consumption in tea manufacturing. Hence, coupling low energy consuming motors into the machineries would be more economical and environmental friendly. Therefore, a study was conducted to assess the effectiveness of introducing High Efficient Motors in tea processing machineries as an energy saving measure. Two experiments were done for withering trough and Rotorvane rollers separately. In experiment one, the performance of High Efficient Motor and High Efficient Motor coupled with Variable Speed Drive in withering were assessed towards Induction motor using three replicates. And in experiment two, High Efficient Motor was compared with Induction motor in Rotorvane rollers using three replicates. The results revealed that, significant energy saving with the use of High Efficient Motor and High Efficient Motor coupled with Variable Speed Drive against the induction motor was 0.015 kWh and 0.026 kWh per kg made tea respectively in Withering Trough. Also there was a significant energy saving of about 0.00058 kWh per kg made tea in Rotorvane rollers with the use of High Efficient Motors against the induction motors. Further, estimated annual saving was about Rs. 25,700.00 and Rs.44, 500.00 with the use of High Efficient motor and High Efficient Motor coupled with variable speed drive respectively in withering and it is about Rs.6, 290.23 in Rotorvane rolling with the use of High Efficient motor. Finally, it can be concluded that, coupling High Efficient Motors in tea processing machineries would be a cost effective and environmental friendly solution.

*Keywords:* Energy consumption, High Efficient Motor, Induction Motor, Rolling, Withering