SUITABILITY OF USING ONE FIX SPEED SCREW COMPRESSOR FOR MULTIPLE COLOR SORTERS IN TEA FACTORIES

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ABSTRACT

One of the crucial issues faced by current tea industry is the high cost of production. But solutions for this issue highly limited as it involve considerable amount of social issues. Thus the remaining way out of this situation is reducing the cost involved in the manufacturing process by increasing the efficiency. Hence the study was done to identify the suitability of using one fix speed screw compressor for multiple color sorters as it can significantly reduce the cost of energy involved.

Here the study was done to compare the one fix speed screw compressor and piston compressor for multiple color sorters. Initially three arrangements were designed to test the energy utilization of three color sorters. Experiment was conducted in three steps. In each step number of color sorters used was increased starting from one to three. This method was practiced for both types of compressors with three replicates. During each experiment constant feeding rate was maintained and similar amount of tea was produced. For the study only the grade PEKOE was used as it is produced in a large amount relative to the other tea grades. Finally using a data a logger energy and the power used during each experiment was recorded.

According to the analyzed data use of three color sorters for one fix speed screw compressor was identified as the most suitable method among the three arrangements of the screw compressor. The results of the study proves that for the piston compressor, color sorter arrangement has no significant effect on its energy utilization. Considering the energy utilization of color sorters it was evident that Piston compressor is much efficient in energy usage than the screw compressor. All in all it can be conclude that use of Piston compressor is much advantageous with regard to efficient utilization of energy, relative to the screw compressor as the number of color sorters used does not effect on the energy utilization of Piston compressor.

Key words- Energy, Saving, Screw compressor, Piston compressor, PEKOE