

***Analysis of the Effect of Inverter-Based Starting on the Transfer
Conveyor Balling Line Drive Motor***

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ABSTRACT

Three-phase induction motors are widely used in industrial applications due to their simple construction, high efficiency, and low maintenance requirements. However, the Direct On Line (DOL) starting method can produce high inrush current, which may affect the electrical system and accelerate mechanical wear on equipment. One solution to this problem is the use of a Variable Frequency Drive (VFD). This study aims to analyze the effect of inverter-based starting on the operating characteristics of a three-phase induction motor used in the Transfer Conveyor system at PT Indah Kiat Pulp & Paper Tbk Perawang Mill.

This research employed a quantitative descriptive method by collecting operational data directly from an ABB ACS880-01 inverter. The observed parameters included output frequency, output voltage, motor current, and motor rotational speed during the acceleration process. The collected data were analyzed by calculating the percentage increase in current, motor speed, and motor slip.

The results showed that the inverter output frequency increased from 30 Hz to 48.98 Hz, while the output voltage increased from 233 V to 380 V. The motor current gradually increased from 4.0 A to 6.1 A, representing a 52.5% increase. The motor speed increased from 894 rpm to 1469.38 rpm, corresponding to a 64.36% increase, while the motor slip under operating conditions was 2.04%. These findings indicate that the ABB ACS880-01 inverter effectively controls the motor starting process by gradually regulating the output frequency and voltage,

resulting in a more stable current profile and motor speed that approaches synchronous speed.

Keywords: Three-phase induction motor, inverter, Variable Frequency Drive, motor starting, transfer conveyor.