# IMPACT OF VOLTAGE WAVEFORM ON THE LOSSES AND PERFORMANCE OF ENERGY EFFICIENCY INDUCTION MOTORS.

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## Abstract

This paper analyzes the effects of voltage harmonic distortion on the losses and efficiency of energy efficient induction motors (EEIM). Preliminary studies show that when fed with distorted voltages the new EEIM have a greater impact on efficiency than standard induction motors. Therefore, in this work a more precise steady state equivalent circuit is used to quantify accurately the impact of the distorted voltage waveform on losses and efficiency of induction motor. The model is validated using two induction motors both of 5.5kW, 50Hz, four poles; one is class IE3 Premium efficiency and the other is class IE1 standard efficiency. The analysis of the results may lead to infer that the EEIM are a good alternative to reduce energy consumption, but the margin is lower under fed with distorted voltages compared with ideal supply conditions.

## Keywords

Energy efficiency, IE1, IE3, Induction motorlosses, Voltage harmonics.