

## Study on the DC Linear Stepper Motor to Industrial Applications

**Authors :** Nolvi Francisco Baggio Filho, Roniele Belusso

**Abstract :** Many industrial processes require a precise linear motion. Usually, this movement is achieved with the use of rotary motors combined with electrical control systems and mechanical systems such as gears, pulleys and bearings. Other types of devices are based on linear motors, where the linear motion is obtained directly. The Linear Stepper Motor (MLP) is an excellent solution for industrial applications that require precise positioning and high speed. This study presents an MLP formed by a linear structure and static ferromagnetic material, and a mover structure in which three coils are mounted. Mechanical suspension systems allow a linear movement between static and mover parts, maintaining a constant air gap. The operating principle is based on the tendency of alignment of magnetic flux through the path of least reluctance. The force proportional to the intensity of the electric current and the speed proportional to the frequency of the excitation coils. The study of this device is still based on the use of a numerical and experimental analysis to verify the relationship among electric current applied and planar force developed. In addition, the magnetic field in the air gap region is also monitored.

**Keywords :** linear stepper motor, planar traction force, reluctance magnetic, industry applications

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