

## “IMPORTANCE OF SPINDLES”



**Mr. Rutvij M. Bhide** (Alumni 2019-20)

B.E. (Mechanical Engineering)

PGDM Operations & Supply Chain Management,

A spindle system is one of the most important key components in an overall machine tool structure. A typical spindle system is fundamentally constructed by a spindle, bearings for supporting the spindle, a driving system for driving the spindle rotation, a cooling system for circulating fluids, and spindle housing for supporting the spindle and the bearings, etc. The rotational speed, power, torque, dynamic stiffness, and thermal properties of the spindle system determine the machining accuracy and productivity of the machining process.

The spindle is the heart of the machine tool, and the most significant component when it comes to making parts. The major theme in manufacturing these days is higher productivity. For the spindle component, this equates to higher speed requirements, increased metal removal rates, longer design life, and improved reliability.

Today, machine tools are required to perform a wider variety of tasks under numerous speed and load conditions and to undergo frequent tool changes. Under such conditions, spindles must accelerate and decelerate faster and more often, subjecting the spindle/bearing system to severe thermal load conditions. In addition, spindles are now exposed to the most extreme and hostile environments.

Fortunately, advances in spindle technologies have kept pace with these demands, allowing us the ability to achieve higher performance than ever before.

