Manufacturing Technology Training
An IMTMA initiative

Machine Tool Spindles - Design Approach
Date : 8 to 12 September, 2025
Venue : IMTMA Technology Centre, Pune

INTRODUCTION

The Machine tool spindle is most sophisticated member in machine tool and plays a vital role for better performance, higher efficiency and accuracy. Design of spindle is very important and a critical activity of machine tool design process. Spindles are integral part of the machine tool and responsible for quality of the final product produced and overall productivity of the machine tools. It is very essential analyze and optimize the design for low cost and better performance. Sizing of the spindle for machine capability in terms of dimension, power, speed, force and accuracy are the key challenges for machine designers for right machine and right application. Understanding the spindle design process is the first step for overall machine success.

FOCUS AREAS

- Types and application Spindles – Turning, Milling, Boring and Grinding
- Bearing selection and arrangements
- Bearing life calculations
- Spindle materials and heat treatment
- Design concepts & Calculations of power speed and torque
- Importance of spindle stiffness on machine performance
- Elastic flexibility of antifriction bearings
- Long hand calculations for computing spindle rigidity
- Calculations for spindle stiffness and bearing life
- Design of Turning, Milling & Grinding spindle as a project
- Design work holding/tool holding system

KEY TAKE AWAYS

After undergoing the programme, the participants will be able to -

- Gain knowledge on types and application of spindles used in metal cutting
- machines
- Understand Bearing selection & pre loading for spindles
- Master Design calculations on spindle design
- Understand Importance of spindle stiffness on machine performance
- FEA approach for computing stiffness and bearing reactions
- Understand first principle calculations for computing spindle rigidity
- Scientific approach for design of spindles+
- Visit to Industry for a realistic feel on manufacturing process and reconditioning of
- spindles
- Benefits
- Thorough knowledge on spindle design fundamentals
- Specialization in spindle design
- Develops full confidence on spindle design
- Understand different configuration of spindles
- Spindle for different application in machine tools

PARTICIPATION FEE

Rs. 16500/-
+18% GST
IMTMA Members/ Micro Companies/ Individuals/ Educational Institutions / Students/ IMTMA Non Members/ Others

USD 660/-
Overseas Participants

Group Concession : 10% for 3 to 5 and 20% for 6 and more delegates being nominated from the same company

PARTICIPANT PROFILE

This programme will benefit practicing Engineers and managers from industry of all segment. Diploma and graduate engineers with more than 2 year experience.

FACULTY

This programme will be conducted by **Mr. S.K. Gupta**.

Mr. S K Gupta is Former Asst. General Manager, Machine Design & Business Development, Tata Motors Machine tools division, Pune. He is an industry expert with over 37 years of rich experience in Design & Development of General purpose & Special purpose Machine tools.

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REGISTRATION : Prior registration for participation is necessary. Number of participants is limited and will be accepted on 'First Come First Serve' basis. A Certificate of participation will be issued to participants.
Important Information : Participation fee includes, course material, working lunch and tea / coffee. Interested companies are requested to register online by clicking on 'REGISTER' button and by filling up the nomination authority and participant's details in specified form.