Manufacturing Technology Training
An IMTMA initiative

Tolerance Stack-Up Analysis
Date : 12 to 14 June, 2024
Time : 1340 Hrs to 1700 Hrs (Online Mode)

INTRODUCTION

Manufacturing process, productivity and cost are often determined by component tolerances. If components are incorrectly toleranced, it leads to assembly problems. Too tight a tolerance leads to higher cost. Designers are expected to tolerance components optimally.

Dimensional variations in production parts accumulate or stack up statistically and propagate through an assembly kinematically, causing critical features of the finished product to vary. Such variations can cause costly problems, requiring extensive rework or scrapped parts. One of the effective tools for managing variations is Tolerance Analysis. Tolerance Analysis is a quantitative tool for predicting the accumulation of variation in an assembly by performing a stack-up analysis, reduces manufacturing costs by improving producibility and also enables design engineers to determine, how robust a design is at the drawing phase.

Keeping this in view, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing a 3 days online training on **Tolerance Stack-up Analysis.**

FOCUS AREAS

- Understanding of stacks and why do we need it
- Applications of stacks
- Product definition per design intent
- Loop diagram per dimensional objective or critical functional relationship to analyze
- Calculate nominal output and variational / tolerance out put
- Worst case tolerance calculation, WC
- Effect of dimensioning practices on tolerance variation
- Root Sum Square, RSS and Modified Root Sum Square, MRSS
- Empirical correction factors, Bender, Gilson, Gladman, and Greenwood
- Part stacks using bonus tolerance. Float and biased floats
- Exercises

KEY TAKE AWAYS

- Understand stack-up analysis and why it is required in today’s design
- Analyse and optimize the designs for ease of manufacturing and assembly while keeping functionality intact
- Identify the critical tolerances which require tighter tolerance control or statistical process control, SPC
- Enlarge drawing tolerances and thereby reducing cost of design
- Develop robust design with low risk of failure

FEE PER PARTICIPANT (PER LOGIN)

Rs. 10625/-
+18% GST
IMTMA Members/ Micro Companies/ Individuals/ Educational Institutions / Students/ IMTMA Non Members/ Others

USD 425/-
Overseas Participants

Group Concession : 10% for 3 to 5 and 30% for 6 and more delegates being nominated from the same company

PARTICIPANT PROFILE

This programme will benefit designers / product design engineers responsible for specifying, interpreting and analyzing tolerances.

Pre-requisite: This programme will directly start with tolerance stacks. Hence, Knowledge of Engineering Drawing and GD&T principles will be a pre-requisite for participants to learn the techniques of tolerance stack-up analysis.

FACULTY

This programme will be conducted by **Mr. Ravi Shankar Nadig**,

Mr. Ravi Shankar Nadig, holds a Bachelor’s Degree in Mechanical Engineering, is a Manufacturing and Dimensional Management Professional with 27 years of experience in Machine tool, Automotive and Aerospace industries, He has worked as a Scientist in Central Manufacturing Technology Institute (CMTI), Bangalore (9 years) and as a Consultant in Tata Consultancy Services (TCS) for 15 years His core competency is in Design and Manufacture of precision machine elements for Defence and Space applications, Manufacturing Engineering support for Fabrication of sheet metal parts of Aero Engine assemblies, Dimensional Management -Tolerance Stack Analysis of Automotive and Aero engines, GD&T practice and training, and Rapid Prototyping.

He is a Senior GD&T professional certified by ASME (Y14.5-2009).

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REGISTRATION : Prior registration with an online advance payment is must. Number of participants is limited and will be accepted on ‘First Come First Serve’ basis. A Certificate of participation will be issued to participants.