Quality LearningHub & Consultancy Singapore
22 Sin Ming Lane, #06-76 Midview City
Singapore 573969
Tel: (65) 6502 8238
Email: carina@qualitylearninghub.com.sg
Website: www.qualitylearninghub.com.sg

TOLERANCE STACK-UP ANALYSIS

Course Objectives:

This workshop begins with a review of GD&T, then continues with practical team exercises designed to educate each participant in how to properly determine the worse-case effects of specified tolerances. This class is a minimum lecture, maximum experience and participation format.

Course Contents:

Introduction to Stack-up methodology

- Quick review of Basics of GD&T (~ 1 hour)
- Importance of Tolerance Stack-up Analysis: Why, when and how
- Introduction to Tolerance Stack-up Analysis:
  - Coordinate dimensioning and tolerancing stacks
  - GD&T stacks
  - Statistical tolerancing stacks: RSS and MRSS
- Methodical steps involved in any stack-up analysis
  - Loop diagram creation
  - Universal sign language of tolerance stack-up analysis
  - Identification of correct dimensional contributors (vectors)
  - Drawing improvements to reduce tolerance stack-up
- Understanding Tolerance Stack-up and Tolerance allocation difference
- Considerations of process capable tolerances

Part Level Stack-up Analysis

- Part stacks using coordinate dimensioning and tolerancing
- Part stacks using position
  - Review of Virtual Condition (VC) Boundary & Resultant Condition (RC) Boundary concepts
  - IB (inner boundary) and OB (outer boundary) calculations
- Part stacks using profile
- Part stacks using runout
- Part stacks using bonus (planar & RFS datums)
- Part stacks using position with bonus tolerance
- Part stacks using combined geometric tolerances

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Assembly Level Stack-up Analysis:

- Assembly stacks using coordinate dimensioning and tolerancing
- Assembly stacks using position:
  - Floating fastener assembly stack-up
  - Floating and Fixed fastener formulas
- Assembly stacks using profile
- Assembly stacks using runout
- Assembly stacks using combined geometric tolerances
- Stacks using form controls applied to a feature
- Stacks using orientation controls applied to a feature without size
- Stacks using orientation controls applied to a feature of size (FOS)
- Introduction to Statistical Tolerancing:
  - RSS (Root Sum Square) Stacks
  - MRSS (Modified Root Sum Square) Stacks
- Comparison between Worst-case method, RSS & MRSS methods

Who Should Attend:

This workshop is designed for anyone who is extremely familiar and proficient with the concepts and practices of GD&T. Particular emphasis is placed on those who are responsible for specifying, interpreting, and analyzing tolerances.

Award of Certificate:

Participants will be issued with a Certificate of Successful Completion upon meeting 75% of the required course attendance.

Duration:

2 days (14 hours)

Course Fee:

$600 nett per trainee (GST is not applicable).

(Course fee is inclusive of all training materials and light refreshments.)