STACK TOLERANCE FOR DESIGN EVALUATION

Quality Tools & Techniques

Introduction

This course is designed for experienced practitioners with deep knowledge in GD&T and want to deepen their skills in the specialized area of tolerance stack.

Manufacturing organization deploys a systematic flow of information to translate customer requirements into the Product Realization.

Objectives

Learners will be able to further advance their skills, knowledge and application of GD&T which involves Design Tolerance Stack-up analysis and calculation using worst-case analysis method to evaluate the accumulation effect of parts and assembly requirements.

These skills and knowledge are vital in the Product Realization, Measurement, Analysis and Improvement and in the Quality Management System consisting of Product Requirements, DFMEA, Mechanical Fit and Mechanical Performance Requirements and Acceptance Criteria to prevent part and assembly failure and to improve manufacturing efficiency.

Duration

3 days | 9am – 5pm | 21 hours

Who should attend

Design, Quality, Manufacturing Engineers and professionals that need involved in mechanical design, product development and quality assurance.

Course Fees

Member: S$1,783.24
Non-Member: S$1,979.44

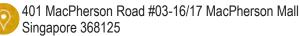*All fees stated are inclusive of Registration Fee and 9% GST.*

Award of Certificate

Certificate of Completion will be issued to participants who have attended at least 75% of the course.

1. **Introduction**
   - What, Why of Tolerance Stack
   - GD&T vital to Mechanical Product Requirements Control
   - GD&T (knowledge) Underpinning Tolerance Stack Analysis
   - Cumulative effect of Tolerance Stack

2. **Tolerance Stack Analysis**
   - Statistical tolerance RSS Variation Analysis Overview
   - Worst-case (Design Tolerance or Stack Up) Tolerance Analysis
   - Different between Worst-case and RSS

3. **Types of Tolerance Stack**
   - Dimensions and tolerances Accumulation
   - Linear Tolerance
   - Repetitive Features with Angularity Tolerance
   - Runout Tolerance

4. **Overcoming Tolerance Stack**
   - Direct dimensioning
   - Tolerance Accumulation Between Surfaces
   - Positional Tolerance
   - Bidirectional Positional Tolerancing
   - Single Axis of Two Coaxial features
   - Single Axis of Two Datum features
   - Position Tolerance Extended Principle
   - Comparable Positional and Profile Controls Tolerance Stack with MMC Principle

5. **Design Tolerance Analysis**
   - Mechanical Tolerance Stack-Up and Analysis
   - Design Tolerance Worst-Case Loop Analysis
   - Tolerance Gap calculation with Loop Analysis

6. **Tolerance Stack-up calculation and Analysis with GD&T**
   - The guiding principle of "Taylor Principle" or "Envelope Principle"
   - Formula for Positional Tolerance for Fasteners
   - Coaxial Mating Features Tolerance Analysis and Calculation
   - Inner and Outer Material Boundary
   - Zero Position Tolerance at MMC and LMC

7. **Tolerance Stack-up Exercises**
   - MMC Position Tolerance of Holes Permissible Distance to Edge of External Feature
   - MMC and LMC position Tolerance on holes permissible distance to a Wall
   - LMC for Minimum Wall Thickness
   - Worst Case Edge Gap of Holes to Datum Features
   - Gap Calculation with Composite Position and Profile Tolerance
   - LMC to Protect a Minimum Distance on Part
   - Gap Calculation of Holes and Guide Pins with Material Condition
   - Pattern Located by Composite Profile Tolerance Stack
   - Composite Positional and Profile Controls Tolerance Stack with MMC Principle

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https://www.sqi.org.sg/courses/
or QR Code for soft copy
and updated training schedule

Membership Application

Register membership online at **www.sqi.org.sg/membership-join/** or contact us to get the membership application form.

Membership Categories:
~ Organisation membership
~ Individual membership

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