

ADVANCED GEOMETRIC DIMENSIONING & TOLERANCING (ADV GD&T)



Objectives

Translating Designer's thought into proper GD&T drawings, including tolerance allocations. You will learn the advanced concepts in GD&T, including:-

- Tolerancing Mating Parts - learn-while-during training session
- Direct Versus Indirect Datum Structures
- Allowed versus Actual Deviation from True Position - Bonus Tolerancing and Virtual Condition Boundaries
- Profile, Flexible Parts and Datum Targets
- Tolerancing Complex Assemblies with Multi-Level Functional Controls and Varying Datum Structures
- Measuring and gauging GD&T, first article inspection, applying CMM to GD&T, and tabulation of results

Duration

3 days | 9am – 5pm | 21 hours

Who should attend

This course is designed for designed for engineers who need to qualify parts with GD&T specifications. You will learn effective ways to measure and gauge geometric tolerances. You will also learn to select the most appropriate measurement techniques for particular GD&T specifications, whether it is prototype or production, batch production or mass production. Enhance understanding by using videos, with step by step explanations, using open setup, gauges or specialised equipment. Course Pre-requisites Participants must possess basic knowledge of GD&T and Tolerance Analysis concepts

Methodology

Participants will learn final details in advanced GD&T. Case studies and hands-on exercises using specially selected drawings allow participants to use and apply the information learnt in the course. Participants may also bring company drawings for interpretation during live case studies.

Course Fees

Member: S\$1,284.00
Non-Member: S\$1,439.15
*Registration Fee of S\$17.12 apply
SDF funding & SkillsFuture applicable
All fees stated are inclusive of 7% GST*

Award of Certificate

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



Please refer to this URL
<https://www.sqi.org.sg/courses/>
or QR Code for soft copy
and updated training schedule



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Course Contents

Recap of Essential Concepts in GD&T

- Datum concepts and applications
- Form control concepts and applications
- Orientation control concepts and applications
- Location control concepts and applications
- Runout control concepts and applications
- Profile control concepts and applications

The Major Principles in Geometric Dimensioning and Tolerancing

- Conventional Dimensioning Versus Profile and Position Tolerancing
- Converting to Positional Tolerancing to Avoid Ambiguities
- Selecting Datum Features
- Tolerancing Datum Features
- Calculating Geometric Tolerances
- Worst Case Least Material Conditions
- Virtual and Resultant Conditions
- Basic Dimensions and Where Their Tolerances Come From

Tolerancing Mating Parts in a Rotating Assembly - learn-while-doing training session

- Read and Understand a Crank Shaft and Coupling Assembly
- Apply Criteria for Optimal Datum Feature Selection to the Assembly
- Form Controls for Assembly and Inspection Repeatability
- Orientation Control for Datum Feature Bonus Tolerance and Pattern Shift

Direct Versus Indirect Datum Structures

- Datum Structures and Their Effect on Tolerance
- Direct and Indirect Functional Relationships
- Tolerancing for Producibility and Functionality
- The Goal of Datums in Inspection and Assembly
- How to Choose Between Datum Structures
- How to Calculate the Feasibility of Various Datum Schemes
- Weighing the Suitability of One Control against Another
- How to Spot Similarities in Dissimilar Part Configurations
- How to Lower Cost without Compromising Function

Allowed versus Actual Deviation from True Position - Bonus Tolerancing and Virtual Condition Boundaries

- Logic behind the Maximum Material Condition concept
- Logic behind the Functional Worst Case Boundaries
- Calculating Actual Departure from True Position
- How to Read a Feature Control Frame to Determine Part Function
- Protecting Virtual Condition Boundaries
- How Additional Positional Tolerances Derived from Feature Size Limits Relate to Worst Mating Condition Boundaries

Profile, Flexible Parts and Datum Targets

- How to Choose Datums and Tolerancing Schemes for complex Sheet Metal and Plastic Parts
- Dealing with Parts with Multiple Curvatures and Angles
- Free State and Restrained versus Free State Inspection Requirements
- Varying Tolerances from Segment to Segment on Surfaces
- Tolerancing Curved Mating Features for Fit
- Measuring Parts as They Function
- Simultaneous versus Separate Gauging Requirements
- Pattern Shift with Simultaneous Requirements
- Fixturing and Stabilising Parts in Presses
- Compound Pattern Datums
- Casting and Draft Angles
- Sheet Metal and Complex Flexible Parts
- Plastic Parts

Tolerancing Complex Assemblies with Multi-Level Functional Controls and Varying Datum Structures

- Detail Analysis of Optimal use of Datums and Functional Controls that escalates in Sophistication
- Determining the Most Functional and Producible Approach to Form, Orientation and Location Control
- Calculating and Distribution of Tolerances in Assembly
- Multi-Level, Two Single-segment Controls for Cost Reduction
- Changing of Datum Structures for Direct Tolerancing Relationships to Produce Greatest Yield

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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