



CADSAGA

“GD&T + Tolerance Stack-up Analysis”

Course Contents

“GD&T: Recap of important GD&T concepts”

GD&T: What, Where, When, Why.. ?

- Introduction to GD&T?
- Bonus tolerance calculations
- Rule # 1 and Rule # 2

Datums

- What is datum?
- Six Degrees of Freedom
- 3-2-1 Principle
- Datum Reference Frame (DRF)
- Datum feature simulators
- Datum Feature Shift (or Datum Shift)

Form Tolerances

- Straightness tolerance for line elements
- Flatness tolerance for single planar feature
- Circularity Tolerance
- Cylindricity Tolerance

Orientation Tolerances

- Perpendicularity tolerance
- Perpendicularity tolerances applied to feature of size
- Parallelism tolerance
- Angularity tolerance

Location Tolerances

A) Position Tolerance

- Position tolerance for cylindrical features (holes / shafts) on MMC and RFS basis
- Detailed table calculations for position tolerance on MMC and RFS
- Floating Fastener Formula and calculations
- Fixed Fastener Formula and calculations

B) Runout Tolerances

- Circular Runout Tolerance
- Total Run out Tolerance for cylindrical feature

C) Profile Tolerances

- Profile of a Line Tolerance
- Profile of a Surface Tolerance
- Profile Tolerance: Bi-lateral type

D) Concentricity & Symmetry Tolerances

- Concentricity Tolerance
- Symmetry Tolerance

"Tolerance Stack-up Analysis"

- Importance of Tolerance Stack-up Analysis: Why, when and how ?
- Introduction of Two-Column method of doing stack-up analysis
- Introduction to Tolerance Stack-up Analysis:
 - Coordinate dimensioning and tolerancing stacks
 - GD&T stacks
 - Worst case 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)
 - Correct stack table filling according to Two-column method
 - How to convert and enter various geometric tolerances into the stack table
 - Drawing improvements to reduce adverse impact on tolerance stack

Part Level Stack-up Analysis

- Part stack using coordinate dimensioning and tolerancing
- Part stack using position
- Part stack using bi-lateral profile
- Part stack using circular runout
- Part stack using total runout
- Part stack using concentricity tolerance
- Part stack using symmetry tolerance
- Part stack using position with bonus (planar & RFS datums)
- Part stack using position with bonus tolerance (MMC)
- Part stack using form controls applied to a feature
- Part stack using orientation control applied to a feature without size
- Part stack using orientation control applied to a feature of size (FOS)

Assembly Level Stack-up Analysis

- Assembly stacks using coordinate dimensioning and tolerancing
- Assembly stacks using position
- Assembly stacks using position (Floating fastener assembly stack)
- Assembly stack using bi-lateral profile
- Assembly stack using total runout
- Stack using form controls applied to a feature
- Stack using orientation controls applied to a feature without size
- Stack using orientation controls applied to a feature of size (FOS)
- Introduction to Statistical Tolerancing:
 - RSS (Root Sum Square) stack concept
 - MRSS (Modified Root Sum Square) stack concept
- Comparison between Worst-case method, RSS & MRSS methods
- Assembly stack using statistical tolerancing

Contact

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Thank You !