



“ISO GPS Geometrical Tolerancing (GD&T)”

Course Contents

Training will be delivered according to these latest ISO GPS Standards:

- ISO 8015:2011
- ISO 1101:2017
- ISO 5458:2018
- ISO 5459:2011
- ISO 2692:2014
- ISO 1660:2017
- ISO 2768-1: 1989
- ISO 22081: 2021
- ISO 14405-1: 2016
- ISO 14405-2: 2018
- and other related ISO GPS standards

GPS Introduction

- What is GPS? Why use GPS?
- How does GPS work?
- Comparison of GPS with Coordinate Dimensioning and Tolerancing

Part Features, Feature of Size, Non-size Features

- What are Part Features?
- Features of Size
- Non-Size Features

14 Geometrical Specifications (GPS Symbols)

- Tolerance indicator (Frame) and its placement
- How to read tolerance indicator?
- Modifier symbols: MMR, LMR, RFS
- When to use MMR, LMR and RFS modifier in design (correct applications)
- Bonus tolerance calculations
- Independency Principle (Default)
- Invoke Envelope principle

Maximum Material Virtual Condition (MMVC)

- Importance of MMVC in product designs and functional gauge designs
- MMVC calculations
- Use MMVC for mating parts as well to design fixed gauges
- 100% interchangeability and MMVC
- Classroom exercise for MMVC

Datums

- What is datum?
- Six Degrees of Freedom
- Datum System (Cartesian coordinate system)
- Datum Feature Selection, Functional Hierarchy
- Datum feature identification / placements and interpretation
- Datum plane, datum axis, Datum median plane
- Physical datum feature simulators
- 3-2-1 principle
- Datum feature qualification
- Importance of Datum Precedence
- Select datum features according to the design intent

Form Specifications

- Flatness specification
- Straightness specification
- Roundness specification
- Cylindricity specification
- CZ Modifier on flatness
- Relationship between Envelope principle and form specifications
- Inspection methods to verify form specifications
- Design recommendation on why to use form specifications only when required to ensure successful design intent

Location Specifications

A) Position Specification

- How it works? How to apply it?
- Tolerance zone shapes
- Position for cylindrical features on MMR, LMR and RFS basis
- Detailed table calculations for position specification on MMR, LMR and RFS
- CZ Modifier
- SZ Modifier
- Position on Boundary basis for rectangular or oblong slots
- Position applied to nominally flat or planar surface
- Inspection methods to verify position specification
- Class room exercise for position

B) Profile Specifications

- How it works? How to apply it?
- Line Profile specification
- Surface profile specification
- 2 types of Profile Tolerance Zone
 - Symmetrical
 - Offset (Unilateral) using UZ Modifier
- SZ / CZ / UF Modifier
- Controlling extent of profile specification
- All-around profile specification
- Inspection methods to verify Profile specifications
- Classroom exercise for profile

C) Coaxiality, Concentricity & Symmetry Specifications

- How it works? How to apply it?
- Coaxiality specification
- Concentricity specification
- Symmetry specification
- Inspection methods to verify concentricity & symmetry specification

D) Run-out Specifications

- How it works? How to apply it?
- Circular run-out specification – Radial
- Total run-out specification – Radial
- Inspection methods to verify run-out specifications

Orientation Specifications

- How it works? How to apply it?
- Perpendicularity specification
- Parallelism specification
- Angularity specification
- Applied to a planar feature
- Applied to feature of size
- Inspection methods to verify orientation specification
- Class room exercise for orientation specifications

Contact

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Thank You !