

Advanced Concepts of GD&T

This course is based on ASME Y14.5 – 2009 Dimensioning and Tolerancing Standard. It is intended for designers, product engineers, manufacturing and assembly engineers, and quality engineers. This courseware is for participants with understanding on fundamental concepts of GD&T.

Advanced concepts include more in depth discussion on selected topics of GD&T that are not covered in fundamentals of GD&T. The examples included are more complex and industrial application oriented.

GD&T Fundamentals Review

- GD&T skills Pre-requisite survey
- GD&T fundamentals for further study

Interpretation of Feature and Feature of Size

- Regular, element, complex, and interrupted feature; sub-feature
- The terms “opposed,” “fully opposed,” “partially opposed,” “size dimension,” and “cylindrical”
- Importance of distinguishing between a feature and feature of size
- Requirements and categories of a feature of size
- Identifying and interpreting a complete, interrupted, partial, and bounded feature of size

Form Controls

- Calculating the straightness tolerance value with application example
- Calculating the flatness tolerance value with application example
- Calculating the circularity tolerance value with application example
- Calculating the cylindricity tolerance value with application example

The Datum System & Datum Feature Types

- Importance and advantages of datum system.
- Common misconceptions of datum system.
- Common errors in datum usage
- Common datum feature types and typical applications
- Degrees of freedom restrained when each datum feature type is used

Datum Targets

- Applications of datum targets
- Specifying fixed and movable datum targets
- Special datum target types

Tolerance of Position Usage

- Applications of tolerance of position control
- Tolerance of position control and material condition used

Simultaneous and Separate Requirements

- Simultaneous and separate requirements, effects and where they apply
- Tolerance of position at MMC simultaneous requirement
- Tolerance of position controls as separate requirements

Composite Position Tolerancing

- Rules, advantages, and when to use it
- “FRITZ” and “PLTZF”
- Tolerance of position composite application

Multiple Single-Segment Tolerance of Position Tolerancing

- Rules, advantages, and when to use it
- Tolerance of position vs. composite tolerance of position

Conical Tolerance Zones

- A conical tolerance zone and advantage of use
- Specifying a conical tolerance zone in a tolerance of position application
- When to use tolerance of position with a conical tolerance zone

Profile Tolerances

- Applications of profile control
- Converting coordinate tolerances into profile callouts
- The profile datum rule

Profile and Simultaneous Requirements

- Simultaneous requirement applied to profile

- Profile controls with separate requirements

Composite Profile Tolerancing

- Composite profile tolerancing, rules, and advantages
- Interpreting a composite profile application

Multiple Single-Segment Profile Tolerancing

- Rules, advantages, interpretation, when to use it
- Profile vs. a composite profile tolerance

Rigid/Non-Rigid Parts Definitions

- Free state
- Restrained state
- Rigid part
- Non-rigid part and part feature