Tolerancing Solid Models

(Based on ASME Y14.41 - 2003)

1. Introduction
- 1.1. Course goals, conventions, and prerequisites
- 1.2. Characteristics of current product development processes
- 1.3. Problems common in current product development processes
- 1.4. What is a math-based product development process
- 1.5. The role of standards in implementing math-based product development processes
- 1.6. Exercise 1

2. General information on the Y14.41 Standard
- 2.1. History of the standard
- 2.2. Terms used in the standard
- 2.3. Data set concept
- 2.4. Two options for creating data sets
- 2.5. Exercise 2

3. Requirements common for annotated model and model & drawing data sets
- 3.1. Data set requirements
- 3.2. Design model requirements
- 3.3. Display management
- 3.4. Model values and resolved dimensions
- 3.5. Basic dimensions
- 3.6. Size dimensions
- 3.7. Exercise 3

4. Model and drawing data sets
- 4.1. Data set requirements
- 4.2. General method requirements
- 4.3. Work coordinate systems
- 4.4. Using section views
- 4.5. Presentation of dimensions in axonometric views
- 4.6. Datum applications
- 4.7. Geometric tolerances
- 4.8. Exercise 4

5. Annotated model data sets
- 5.1. Data set requirements
- 5.2. General model requirements
- 5.3. Views on annotated models
- 5.4. Model requirements
- 5.5. Resolved dimensions
- 5.6. Datum applications
- 5.7. Geometric tolerances
- 5.8. Exercise 5

6. Gaps, issues, and challenges for industry
- 6.1. Gaps, issues, and challenges
- 6.2. Future trends
- 6.3. Exercise 6

7. Why it is important to use Y14.41
- 7.1. Benefits of using the standard
- 7.2. How to purchase the standard
- 7.3. Creating an addendum to the standard
- 7.4. Course summary

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Course Description:

This course compares the shortcomings of current product development processes with the benefits of math-based processes and explains how they can benefit industry. It covers fundamental definitions, concepts, and methods from the new Y14.41 standard. The course shows how to create dimensions and tolerances on models in accordance with the ASME Y14.41 Standard. It also covers how to make reduced dimension drawings in accordance with Y14.41. Both methods can be used to eliminate 2D drawings. The course is not based on any single CAD system or product development process. It covers concepts and standards that can be applied with a number of CAD systems. The course also discusses the current status, issues and future of tolerancing models in industry.

Course Prerequisites:

Attendees must have a basic understanding of Y14.5 Dimensioning and Tolerancing practices

Who Should Attend:

This course intended for designers, engineers, and managers who are implementing math-based product development processes.

Course Length:

The course is 8-hrs long.

Course Materials:

- A *Digital Product Definition Workbook,* by Alex Krulikowski
- A certificate of completion

Course Goals:

- To understand the benefits of a math based product development process.
- To become familiar with the ASME Y14.41-2003 Standard on Digital Product Definition Data Sets.
- Understand how to create model and drawing (reduced dimension drawings) as a data set in accordance with Y14.41
- Understand how to annotate models in accordance with Y14.41.
- Understand gaps, issues and challenges facing industry in transitioning to a math based product development process.

Course Benefits:

- Learn about the ASME Y14.41 Standard and how to apply it in your organization
- Learn about the status, issues, challenges, and plans for model tolerancing in industry
- Gain insights on math-based product development and how it can benefit your organization
    - Reduced dimension drawings can save 20-50% time over conventional drawings
    - Annotated models can save 50-70% time over conventional drawings