

YSWUG - 9/6/12

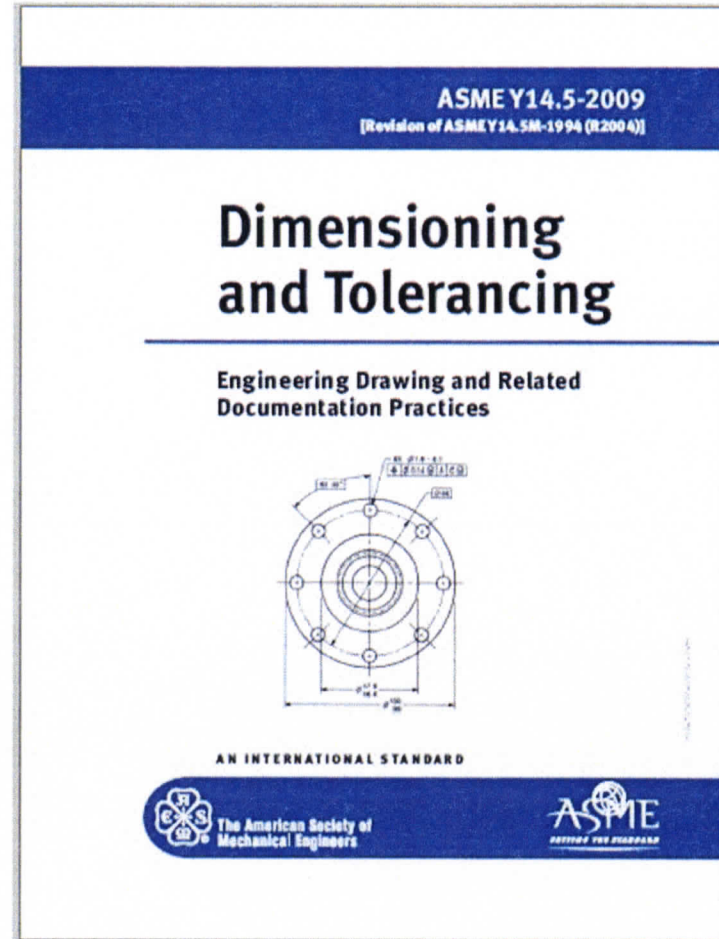
Dimensioning and Tolerancing  
Using DimXpert in Models and  
Drawings

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# Agenda

- Introduction
- DimXpert Basics
  - ✓ Applicable ASME and ISO Standards
  - ✓ Digital Product Definition
  - ✓ DimXpert Benefits
  - ✓ DimXpert Functionality
  - ✓ DimXpert Options
- SolidWorks DimXpert Video
- Live DimXpert Demonstration

# The Bible

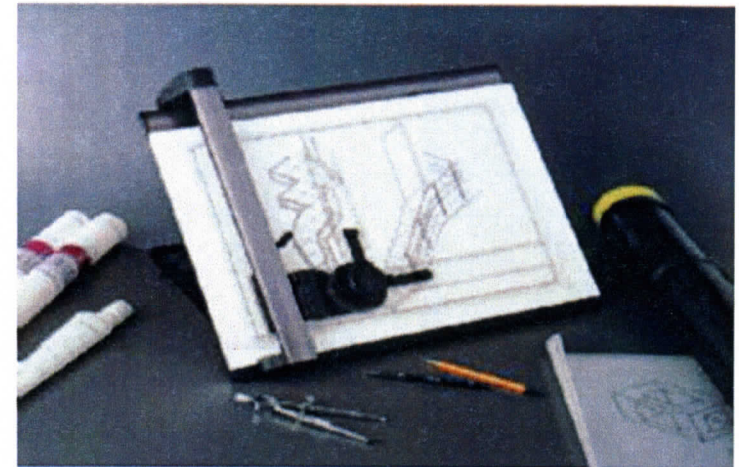
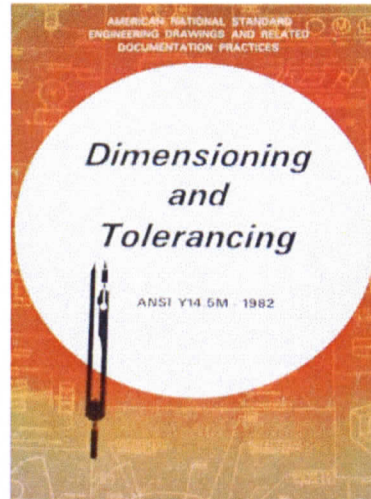


# Contents of ASME 14.5 2009

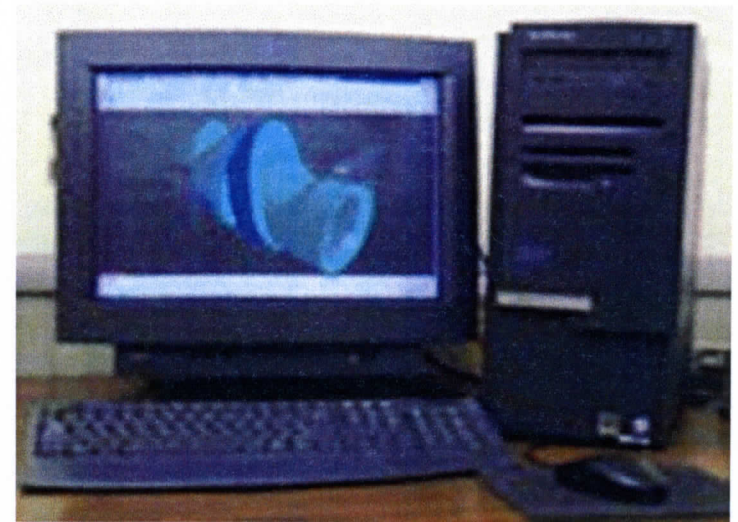
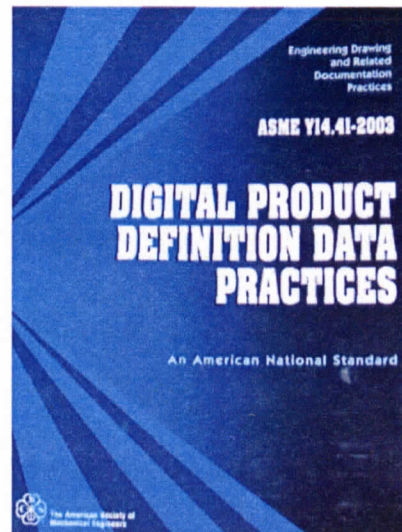
- **Section 1** – Scope, Definitions, and General Dimensioning
- **Section 2** – General Tolerancing and Related Principals
- **Section 3** – Symbology
- **Section 4** – Datum Reference Frames
- **Section 5** – Tolerances of Form
- **Section 6** – Tolerances of Orientation
- **Section 7** – Tolerances of Location
- **Section 8** – Tolerances of Profile
- **Section 9** – Tolerances of Runout

# ANSI Y14.5 and ISO 1101: The Industry Standards

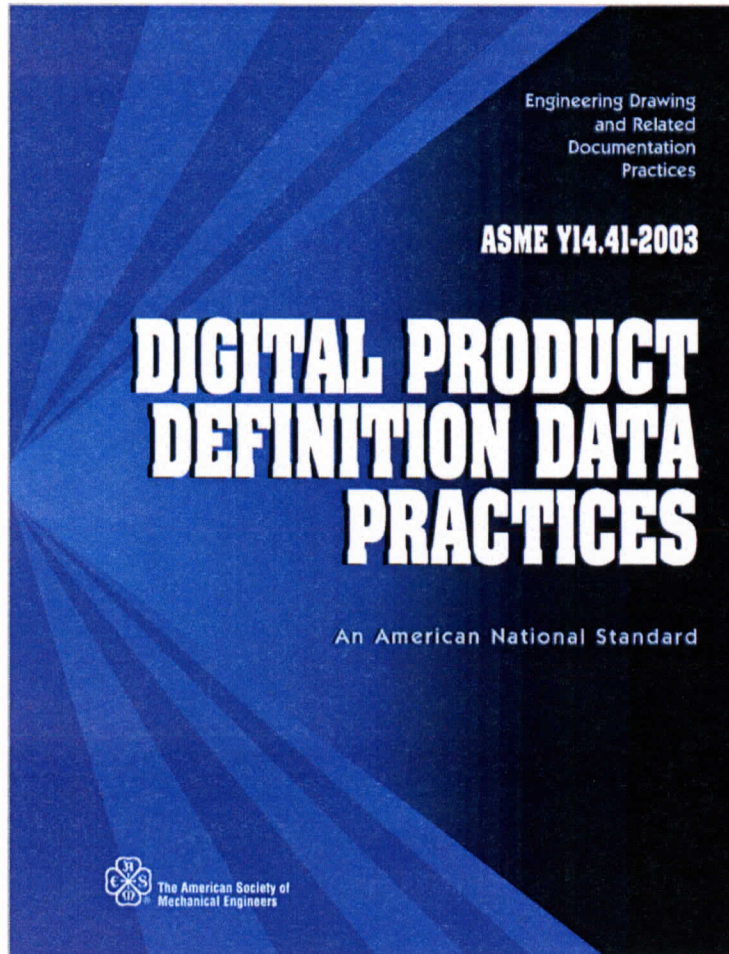
- Application of GD&T
  - Y14.5M-1994
  - ISO 1101



- Display of GD&T in 3D
  - Y14.41-2003
  - ISO 16792



# Digital Data Practices

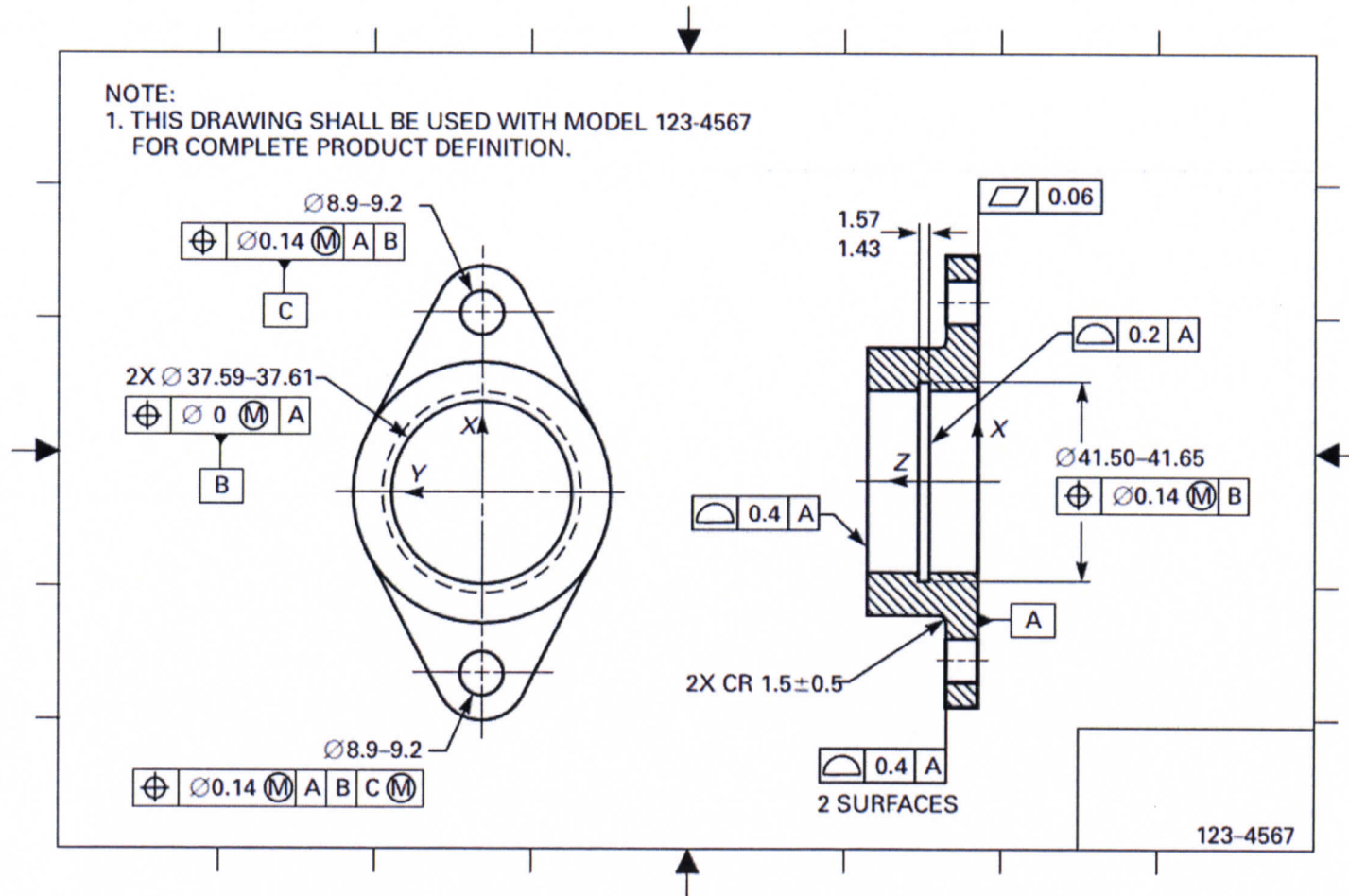


Uses: of Y14.41-2003

- Reduced Content Drawings
- Minimally Dimensioned Drawings

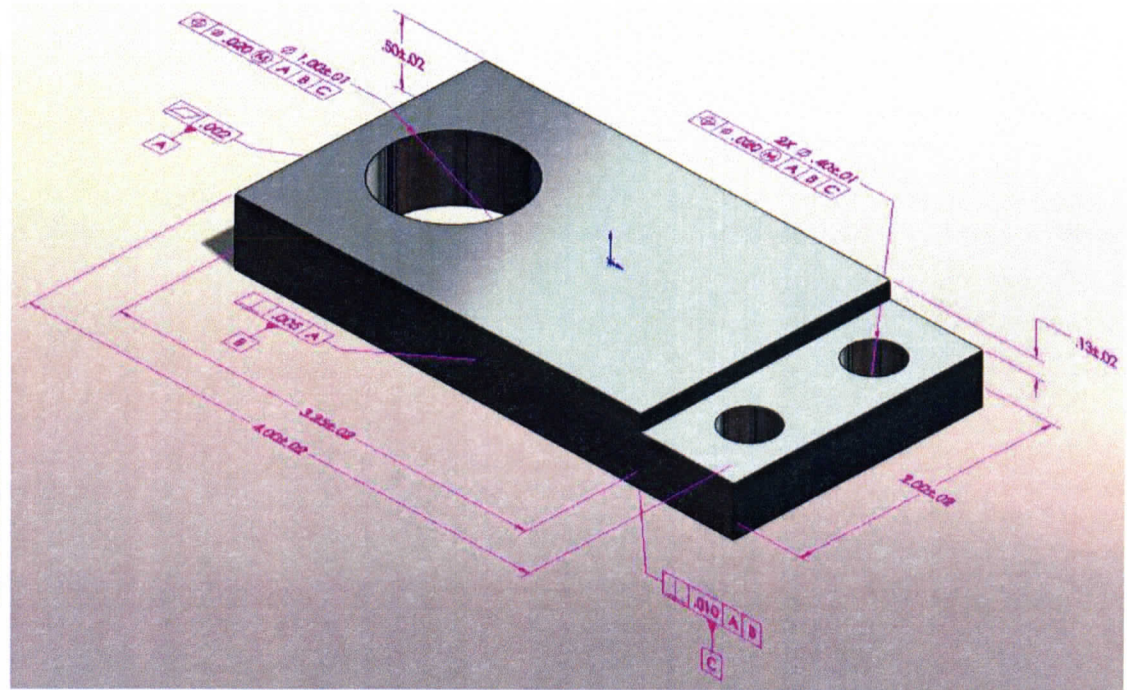
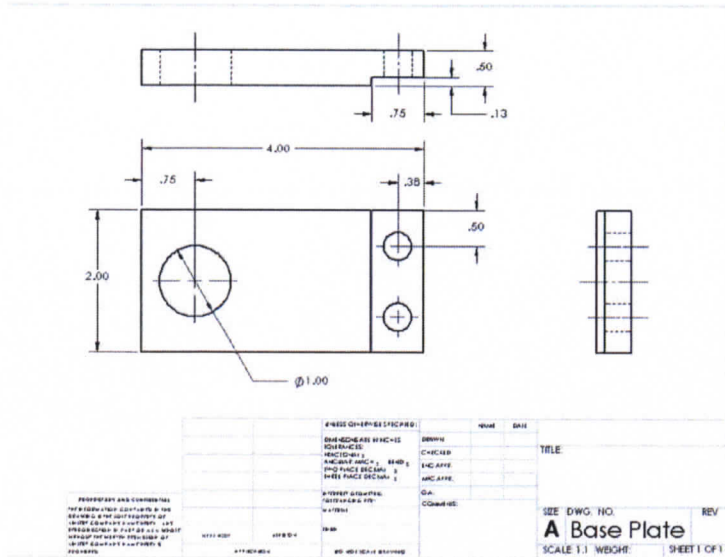
ASME Y14.41 standard is for any company with engineering, manufacturing, or inspection practices that contain or utilize CAD data

# Example Control Drawing



# DimXpert: [*dim-ek-spurt*]-noun. **SWIFT Driven**

- A means to apply dimensions and tolerances to a part model based on the ANSI Y14.5 and Y14.41 GD&T standard or the equivalent ISO standards.
  - ANSI Y14.5 and ASME Y14.41
  - ISO 1101 and 16792 (based on ANSI/ASME standards)





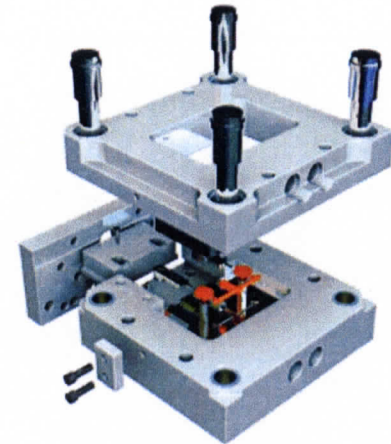
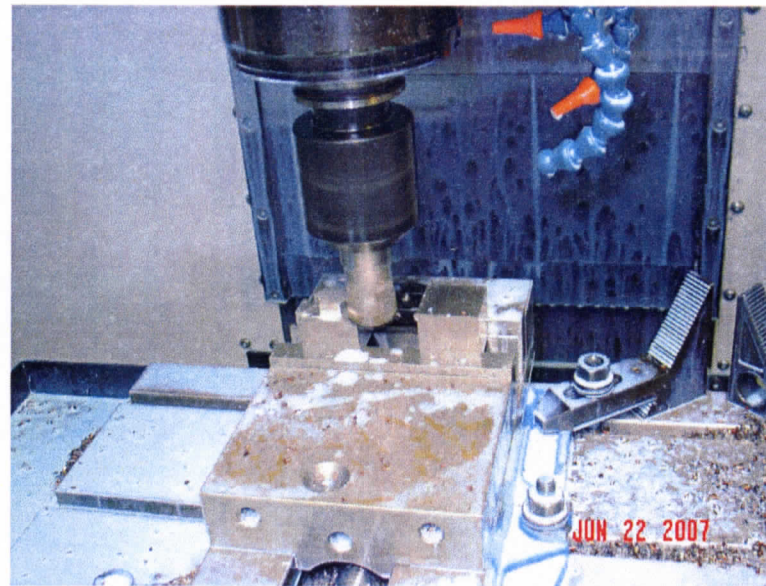
# True Power of DimXpert

## *Different Than Model Creation*

- Modeling – Uses dimensions to establish design intent
- Drawings – Uses models for manufacturing and Inspection

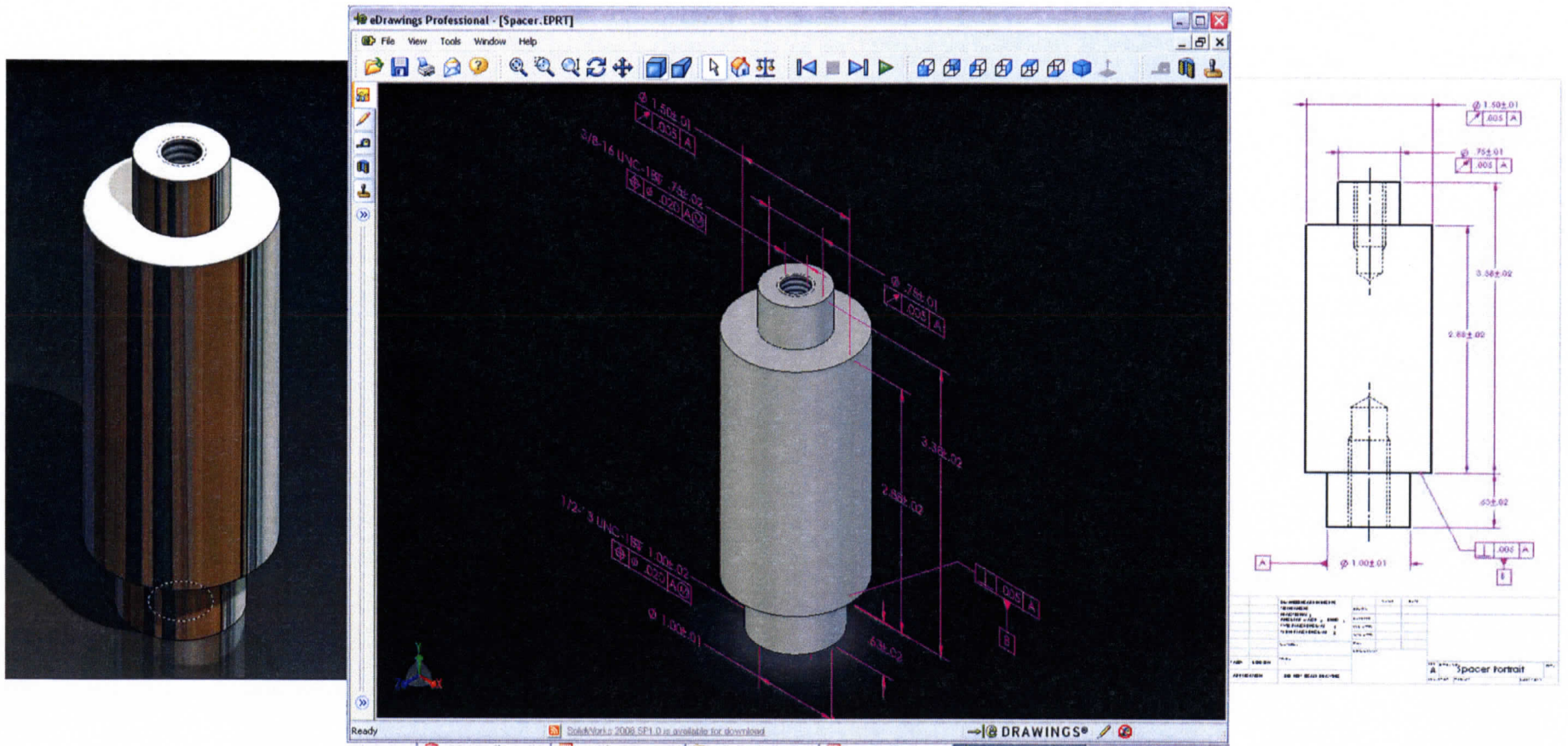
# DimXpert: Benefits

- No need for expert status on GD&T in order to produce compliant dimension/tolerance scheme.
- GD&T can produce lower manufacturing costs by allowing looser tolerances and reduce assembly fit problems.
- Fewer errors are generated and consistency is maintained using settings for plus/minus and GD&T in the options page.



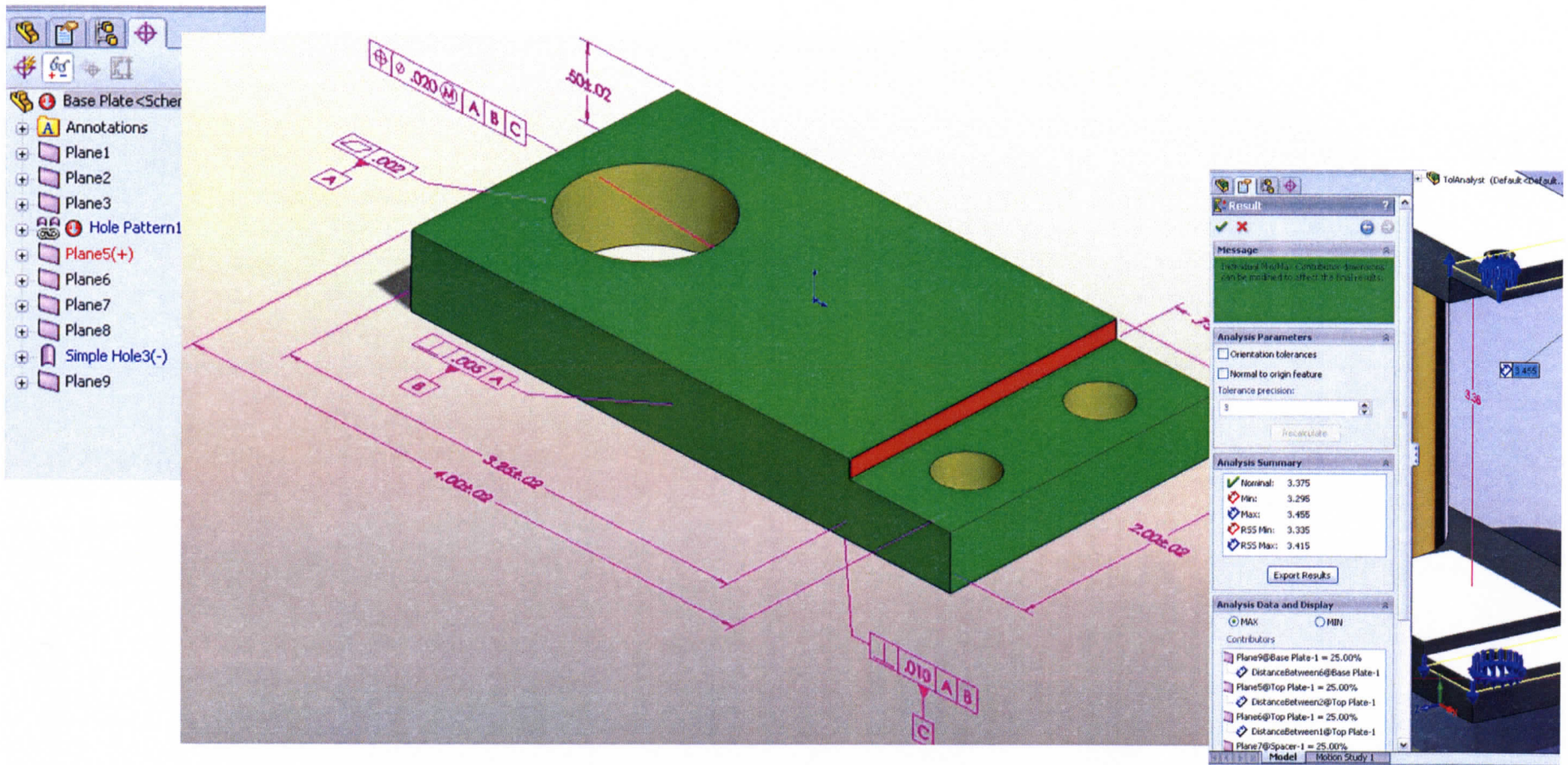
# DimXpert: Benefits

- 3D Models are fully annotated and can be viewed with EDrawings.
- Creation of 2D drawings is faster and easier utilizing DimXpert dimensions.



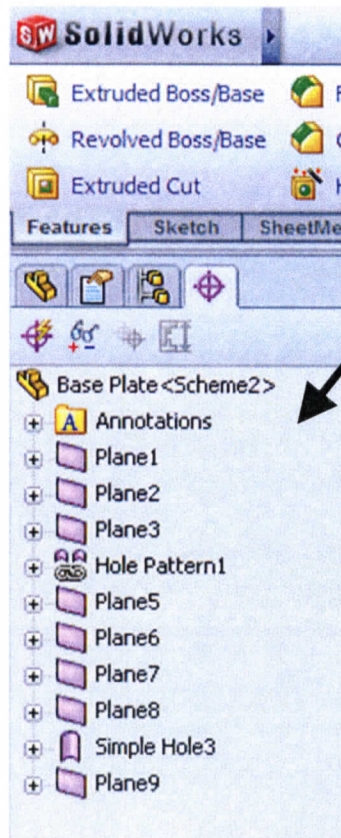
# DimXpert: Benefits

- Quickly identify under or over toleranced parts graphically.
- Dimensions can be automatically analyzed for tolerance stack using TolAnalyst.



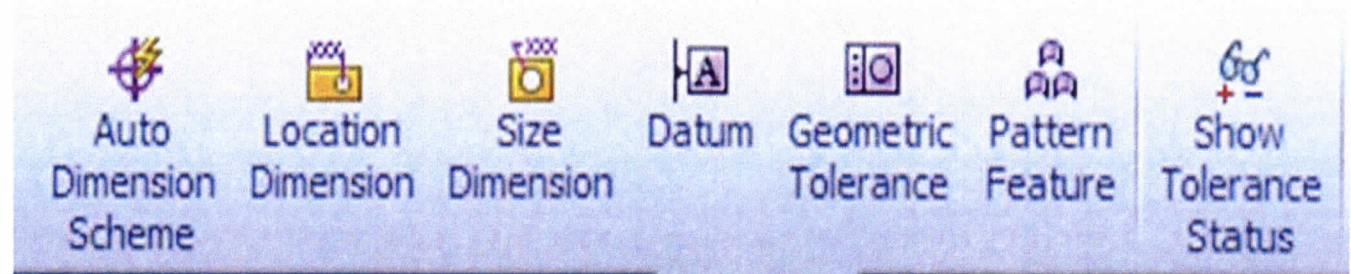
# DimXpert: Functionality-Navigation and Toolbar.

- DimXpert Feature Manager tree displays all the defined manufacturing features.
- Dedicated Toolbar provides all commands for control of DimXpert

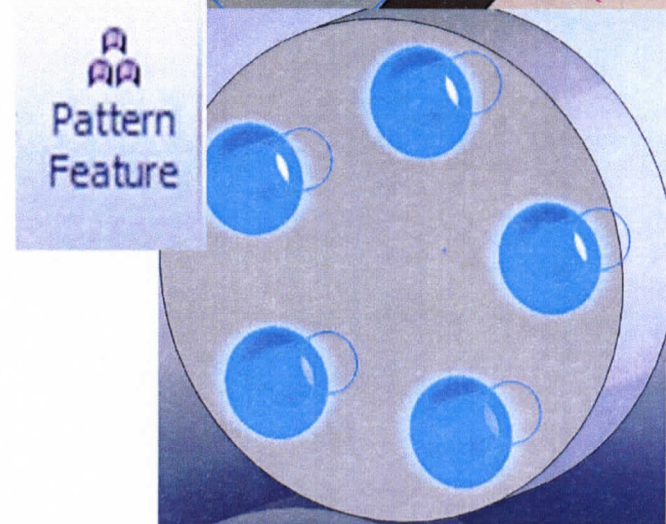
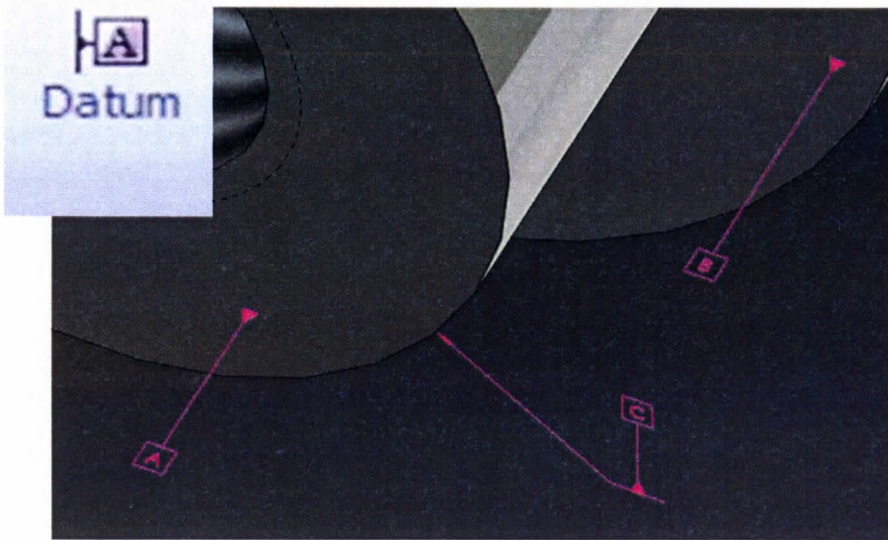
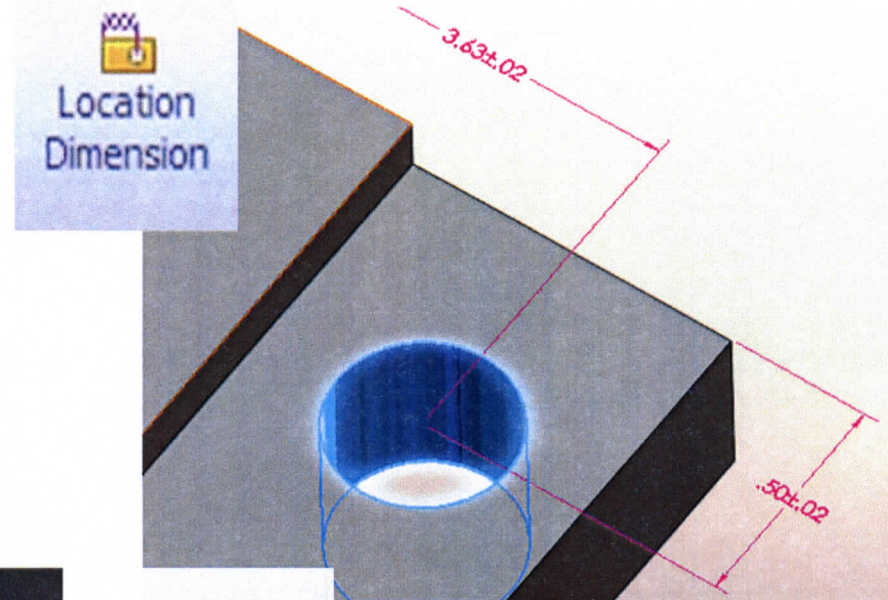
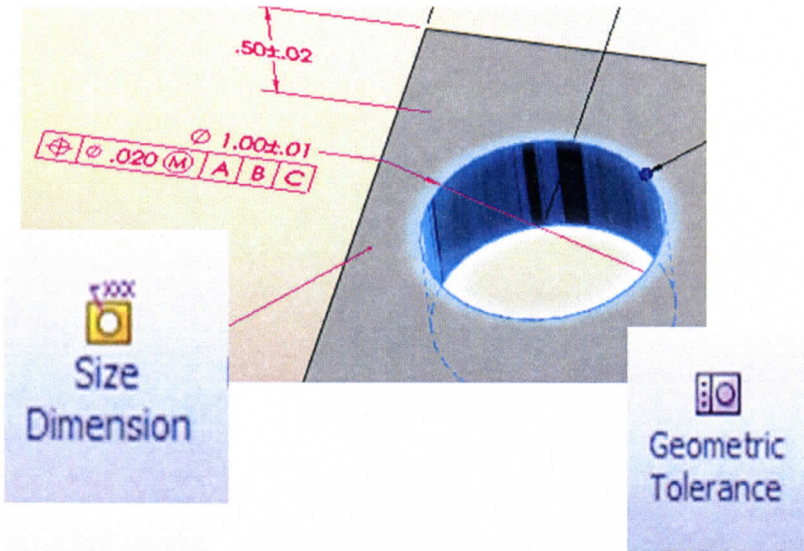


DimXpert Feature Manager

DimXpert Toolbar



# DimXpert: Functionality-Datums and Dimensions.



# DimXpert: Functionality-Auto dimension and Status.

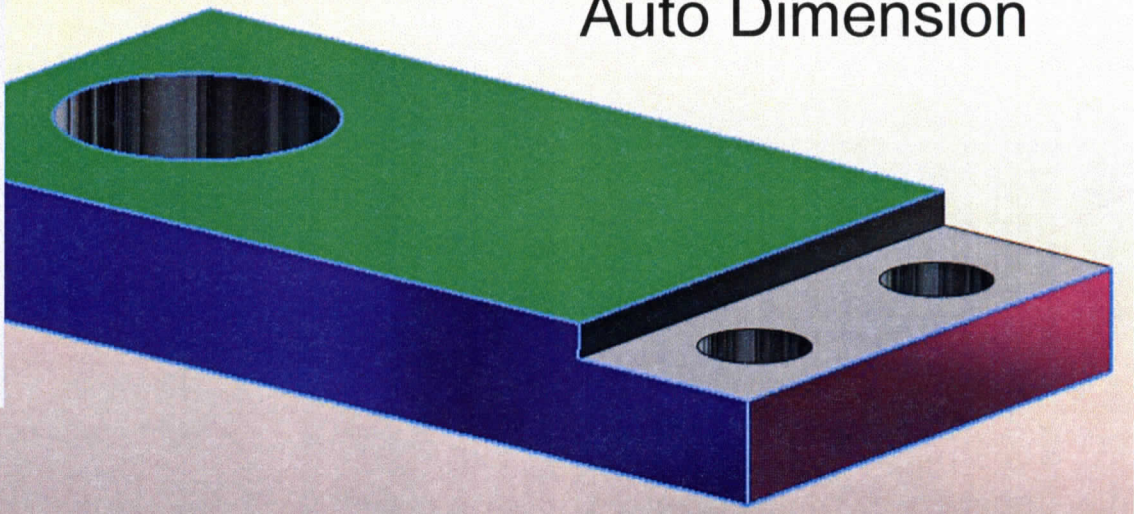
**Reference Features**

Primary Datum:  
Plane3

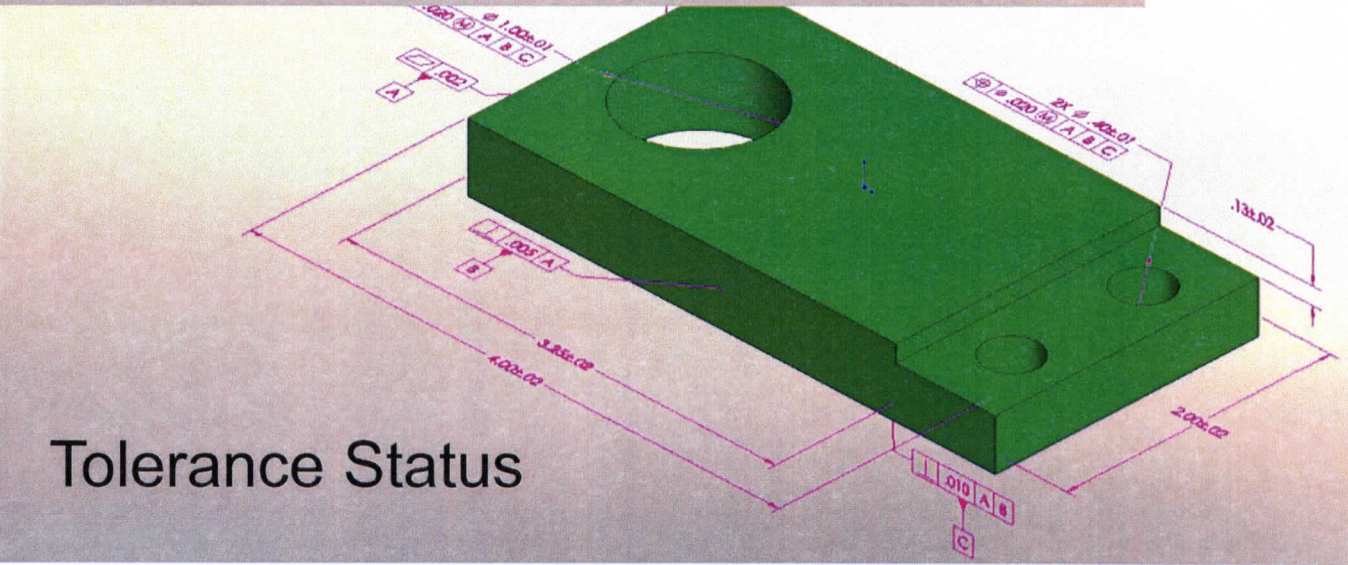
Secondary Datum:  
Plane4

Tertiary Datum:  
Plane5

Auto Dimension



Tolerance Status



# DimXpert: Functionality-Options.

- Tools/Options/Document Properties

## DimXpert

- Size Dimension
- Location Dimension
- Chain Dimension
- Geometric Tolerance
- Chamfer Controls
- Display Options

Document Properties - DimXpert

System Options Document Properties

Detailing

- Dimensions
- Notes
- Balloons
- Arrows
- Virtual Sharps
- Annotations Display
- Annotations Font

Grid/Snap

Units

Colors

Material Properties

Image Quality

Plane Display

DimXpert

- Size Dimension
- Location Dimension
- Chain Dimension
- Geometric Tolerance
- Chamfer Controls
- Display Options

Methods

Block Tolerance  General Tolerance

Block tolerance

Length unit dimensions

|              | # of Decimals | Value        |
|--------------|---------------|--------------|
| Tolerance 1: | 2             | 0.0003937in  |
| Tolerance 2: | 3             | 0.00055118in |
| Tolerance 3: | 4             | 0.00009843in |

Angular unit dimensions

Tolerance: 0.01deg

General tolerance

Tolerance Class: Medium



# DimXpert: Functionality-Options.

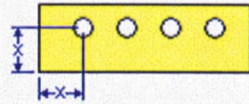
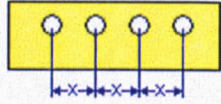
## Size

|  |  |
|--|--|
| <b>Diameter</b><br>Symmetric <input type="text" value="0.01in"/>             | <b>Length - slot/notch</b><br>Symmetric <input type="text" value="0.02in"/>      |
| <b>Counterbore diameter</b><br>Symmetric <input type="text" value="0.01in"/> | <b>Width - slot/notch/width</b><br>Symmetric <input type="text" value="0.01in"/> |
| <b>Countersink diameter</b><br>Symmetric <input type="text" value="0.02in"/> | <b>Depth</b><br>Symmetric <input type="text" value="0.02in"/>                    |
| <b>Countersink angle</b><br>Symmetric <input type="text" value="1.00deg"/>   | <b>Fillet radius</b><br>Symmetric <input type="text" value="0.01in"/>            |

## Location

|  |
|--|
| <b>Distance</b><br>Symmetric <input type="text" value="0.02in"/> |
| <b>Angle</b><br>Symmetric <input type="text" value="1.00deg"/>   |

## Chain

|   |  |
|---|--|
| <b>Dimension method</b>   |  |
| Hole dimension<br><input checked="" type="radio"/> Chain <input type="radio"/> Baseline   | Pocket dimension<br><input checked="" type="radio"/> Chain <input type="radio"/> Baseline  |
| <b>Hole/slot/notch pattern tolerance</b>  |  |
| <b>Pattern location</b><br>Symmetric <input type="text" value="0.02in"/><br> | <b>Distance between features</b><br>Symmetric <input type="text" value="0.02in"/><br> |

# DimXpert: Functionality-Options.

## Geometric Tolerance

Apply MMC to datum features of size

Use as primary datums: form gtol

0.002in

Use as secondary datums: orientation or location gtol

Feature of size: 0.005in

Plane features: 0.005in

Use as tertiary datums: orientation or location gtol

Features of size: 0.01in

Plane features: 0.01in

Basic dimensions

Create basic dimensions

Chain  Baseline

Position

At MMC

Composite

0.02in

0.01in

Surface profile

Composite

0.02in

0.01in

Runout

0.005in

## Chamfer Controls

Width settings

Chamfer width ratio: 1

Chamfer maximum width: 0.40in

Tolerance settings

Distance: Symmetric


± 0.02in

Angle: Symmetric

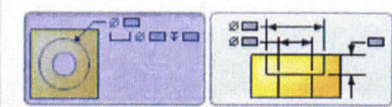
± 1.00deg

## Default Display Options (ANSI and ISO)

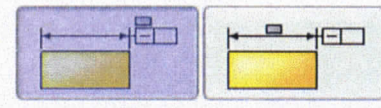
Slot dimensions



Hole callouts

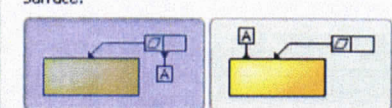


Gtol linear dimension attachment

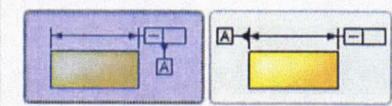


Datum gtol attachment

Surface:



Linear Dimension:

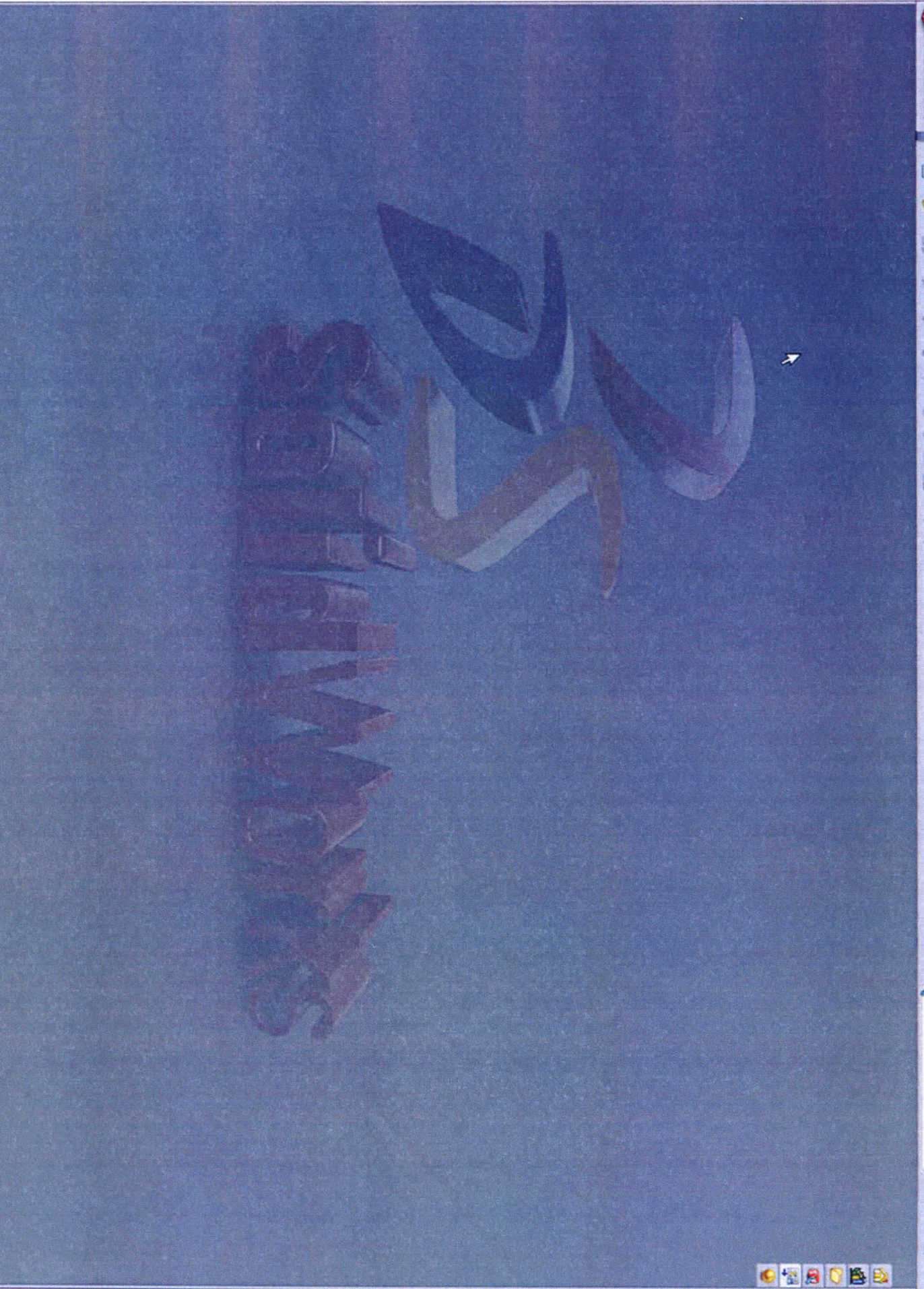


Redundant dimensions and tolerances

Eliminate duplicates

Show instance count

**SolidWorks  
DimXpert  
Video**



# SolidWorks Demo

- Open solid model and fully dimension with DimXpert using plus-minus dimensioning
- Create fully dimensioned drawing from above part
- Show location of tutorial
- Fully Dimension above part using GD&T

THANK YOU!

