
Basic Measurement Tools and Techniques

On-Site Seminar

Dimensional measurements of characteristics such as length, width, depth, diameter, or height are fundamental to manufacturing physical products in all industry segments. Reliable dimensional measurements can help to improve product quality and increase productivity while reducing overall manufacturing costs.

Our On-Site Seminar, *Basic Measurement Tools and Techniques*, provides participants with hands-on training and in-depth information on how to:

- Properly Select, Use, and Care for Dimensional Measurement Equipment
- Perform Actual Measurements of Physical Characteristics using Commonly Available Equipment
- Understand and Identify the Sources and Types of Measurement Errors
- Measure and Record Results in Inch or Metric Units for direct Comparisons to Actual Requirements
- Identify and Understand Equipment Calibration Status to Ensure the Validity of Measurements

The Seminar is designed for presentation to a mixed audience of Engineering, Manufacturing, and Quality Department personnel. The program can be customized to meet the specific needs of:

- Engineering, Manufacturing, or Quality Managers
- Production Supervisors, Setup Personnel, Machine Operators, or Assemblers
- Quality Engineers, Gage Designers, or Inspectors
- Design, Manufacturing, or Production Engineers
- Part Programmers or Fixture Designers

Basic Measurement Tools and Techniques consists of eight instructional units and requires approximately 12 to 16 hours for presentation. Participants receive a Learner Handbook, a Learner Workbook, and additional materials. Various presentation schedules are available to meet your specific requirements.

Call us to learn more about how improving the understanding, use, and reliability of dimensional measurements can improve product quality and increase productivity with reduced costs at your company.

Seminar Outline:

Unit 1 - Background

- U.S. Customary Units
 - Inch
 - Thousandth
 - Ten-Thousandth
 - Millionth
- Metric System
 - International System of Units (SI)
 - Meter
 - Decimeter
 - Centimeter
 - Millimeter
 - Nanometer
- Angular Units
 - Degrees
 - Minutes (Arc Minutes)
 - Seconds
 - Radians
- Conversions/Relative Sizes

Unit 2 - Terms and Definitions

- Measurement
- Measureand
- True Value
- Accuracy
- Error
- Trueness
- Bias
- Precision
- Repeatability Condition
- Repeatability
- Reproduceability Condition
- Reproduceability
- Uncertainty
- Standard
- Tolerance

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Unit 3 - Fixed Gages

- Plain Gages
 - Plugs
 - Rings
 - Other Geometries
- Thread Gages
 - Plugs
 - Rings
- Gage Blocks

Unit 4 - Variable Gages

- Rules
- Calipers
 - Vernier
 - Dial
 - Digital
- Micrometers
 - Mechanical
 - Dial
 - Digital
- Dial Indicators
 - Dial Indicators
 - Dial Test Indicators
 - Digital Indicators

Unit 5 - Surface Plates and Accessories

- Surface Plates
- Angle Blocks
- V-Blocks
- Parallels

Unit 6 - Surface Plate Equipment

- Transfer Stands
- Height Gages
 - Micrometer
 - Vernier
 - Dial
 - Digital

Unit 7 - Use and Care of Measurement Equipment

- General Use and Care
- Fixed Gages
- Variable Gages
- Surface Plates and Accessories
- Surface Plate Equipment

Unit 8 - Calibration

- Calibration
- Calibration Status
- Validation

For more information on our complete range of products and services, please visit us on the web, call, or write...

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