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# Basic Assembly Tools and Techniques On-Site Seminar

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Mechanical, electromechanical, electronic, and optical assemblies are used to manufacture products today in many different industry segments. Properly building, installing, and protecting these assemblies at each stage of the manufacturing process can help to improve product quality and reliability, increase productivity, and significantly reduce internal or external failure costs.

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

- Properly Select, Use, and Care for Assembly Equipment
- Reliably Perform Assembly Operations using Mechanical, Electrical, Electronic, or Optical Components
- Prevent Physical Damage or Contamination During Assembly Operations
- Minimize the Potential for Equipment Failures due to Electrostatic Discharge
- Properly Identify, Use, and Install Common Types of Assembly Hardware and Fasteners
- Understand and Perform Assembly Operations with Specific Torque Requirements
- Interpret and Follow Assembly Related Procedures and Work Instructions

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 Assembly Tools and Techniques* consists of seven instructional units and requires approximately eight hours for presentation. The program can also be completely customized and expanded to include images and illustrations of your products, internal procedures and work instructions, and other types of information and materials of specific interest to your operations.

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 to improve the quality and productivity of assembly operations with reduced costs at your company.

## Seminar Outline:

### Unit 1 - Basic Wiring Standards

- Wire Routing and Bundling
- Abrasion Protection
- Strain Relief
- Electromechanical Assembly Standards
  - Barrier Strips
  - Connectors
  - Panel Components
  - Insulated Terminals
- Grounding

### Unit 2 - Electrostatic Discharge Control

- Static Electricity
- Electrostatic Charge
  - Conductors and Insulators
  - Electrostatic Voltages Created by Common Activities
- Electrostatic Discharge (ESD)
- Effects of ESD
  - Catastrophic Failures
  - Latent Defects
- ESD Control Tools and Techniques
  - Wrist Straps
  - Foot Grounders
  - Treated Floors
  - Floor Mats
  - ESD Protective Workstations
  - Additional ESD Control Devices
  - ESD Protective Packaging

### Unit 3 - Hardware and Fasteners

- Types of Hardware and Fasteners
  - Screws and Bolts
  - Threaded Fastener Specifications
  - Nuts
  - Washers
  - Pins
  - Assembly Hardware
- Selection for Assembly
- Coatings
- Cleaning and Rust Prevention

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## Unit 4 - Force and Torque

- Terms and Definitions
  - Force
  - Tension
  - Compression
  - Pound-Force
  - Ounce-Force
  - Newton
  - Torque
- Units of Torque
  - U.S. Customary Units
  - SI Units
- Torque Measuring Devices
  - Torque Wrenches
  - Torque Screwdrivers
  - Micro Torque Measurement Tools (Torque Watches)
- Torque Limiting Devices
  - Manual Devices
  - Driven Devices
- Setting Torque Limiting Devices
  - Manual Screwdrivers
  - Manual Wrenches
  - Driven Devices
- Joint Hardness

## Unit 5 - Mechanical Work Standards

- Cleanliness
  - Workstations
  - Surface Plates
  - Subassemblies
- Scratch Prevention
- Fingerprints
- Rust Prevention
- Procedures and Work Instructions
  - Procedures
  - Work Instructions
  - Assembly Drawings
- Fastener Work Standards
  - General Hardware Rules
  - Screws and Bolts
  - Nuts
  - Thread Projections
  - Engagement
  - Countersinks
  - Tightness of Installation
  - Interference with Adjacent Structures
  - Securing
  - Use of Locking Devices
- Specifications
- Final Appearance
  - Protective Films
  - Mechanical Alignment
  - Scratches
  - Dust and Dirt
  - Fingerprints

## Unit 6 - Housekeeping

- Work Areas
- Care of the Equipment
- Cleanliness
- Liquids and Spills
- Trash and Scrap Removal
- Safety

## Unit 7 - Optical Components

- Lenses and Optical Components
- Handling
- Cleaning
  - Dust and Dirt
  - Other Contaminants
  - General Cleaning Techniques
  - Optical Component Cleaning Cautions
- Verification of Cleanliness
- Use of Gloves
- Optical Component Assembly
  - Tools and Techniques
  - Verification of Assembly

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

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