

ESD CONSULTING SERVICES PLT

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Course Title: AUTOMATED HANDLING ESD REQUIREMENTS

Synopsis

As the quest for more and more highly automated robotic equipment be deployed in the electronics industries, so is the challenge for such sophisticated equipment to be ESD safe.

The course specially focus on the aspects on ensuring the equipment used is ESD safe. It starts off with grounding which is one of the most critical parameters, followed by field measurements and lastly event measurements as per requirements in ANSI ESD SP10.1 revision 2016.

The lecturer will draw on his wealth of experience in ESD field to provide detail insights into how to conduct studies on the equipment to ascertain if it is ESD safe.

What You Will Learn

On completion of training, participants will be able to ascertain if the automated equipment is ESD safe.

Who Should Attend

Manufacturing, Product, Test and QA engineers and technicians.

Prerequisite

Participants should have at least a basic science and/or engineering background and have the required ESD knowledge and preferably worked in the electronics industry.

Course Methodology

The course is practically orientated with numerous examples and demos in order to help the attendees understand the course. All related equipment necessary for qualifying the machine will be demonstrated. Even real life examples of Static Event Detection using SCS Event Detector will be shown. Participants are encouraged to participate and ask questions during the session. A pre and post tests will be held in order to assess the performance of the class. It is recommended that the size of the class be 25 or less participants in order to enable enough attention and time allocation for the subject matter to be well understood. Each participant will be provided a handout and certificate on successful completion of the course.

Course Duration

2 days 9am - 5pm

Course Structure

1. Introduction to ESD

- What is ESD?
- Definition of ESD
- Why is ESD event often ignored?
- Concept of "cradle to grave" requirement
- What is the confusion of EOS over ESD?
- Differences between EOS and ESD
- Importance of ESD
- Difference between catastrophic versus latent failure
- What worsens ESD as technology advances?

2. Fundamentals of ESD

- Basics of static electricity
- Effects of grounding on insulators versus conductors
- Concepts of Faraday cage
- Law of induction
- Basic grounding requirements
- Relationship of charge, capacitance and voltage
- Methods of electrostatic voltage generation (contact and contactless methods)
- Triboelectric series
- Effects of humidity on ESD charges
- Helmholtz method of generating ESD charges
- How ESD damages sensitive components?
- Component/board direct and indirect charging
- Concept of virtual grounding
- ESD device susceptibility
- Level of sensitivity of device, board and system versus voltages
- How does dielectric breakdown and meltdown occur?
- How to distinguish between EOS and ESD failures?
- Common causes of ESD
- Human negligence and poor ESD controls
- Proliferation of automated systems without proper ESD control considerations
- First case study of ESD damage caused by trim and form machine.
- Second case study of ESD damage caused by plastic pick and place suction cups.

3. High resistance and charge accumulation measurements

- Instrument requirements
- Selection of probes
- Voltage charge accumulation tests using voltage sensor versus high impedance contact digital voltmeter
- Static versus dynamic testing
Types of measuring equipment considerations
- Digital multimeter
- Surface resistance meter
- Electrostatic voltmeter
- High impedance contact probe meter

4. Grounding requirements

- What are the various types of grounding
- Why is equipment grounding of such importance?
- Impact of lack of grounding causing high voltages built up
- Mitigation for non-groundable situations
- Grounding guidelines

5. ESD event measurement

- Why is event measurement critical?
- Types of event detectors in the market
- Preparation needed to conduct the study
- Location placement of sensor considerations
- How to conduct dry runs?
- How to conduct wet runs?
- What to look for in the evaluation?
- Analysis of the results

6. Hands-on training on Automated Handling equipment in production line.