Standards Documents

Standards, Standard Test Methods and Standard Practices have completed the industry comment and review process, and the document has been approved by the Standards Committee as a Final Standard Document.

ESD S1.1—1998: Evaluation, Acceptance, and Functional Testing of Wrist Straps. A successor to EOS/ESD S1.0, this document establishes test methods for evaluating the electrical and mechanical characteristics of wrist straps. It includes improved test methods and performance limits for evaluation, acceptance, and functional testing of wrist straps.

ESD STM2.1—1997: Resistance Test Method for Electrostatic Discharge Protective Garments
This Standard Test Method provides test methods for measuring the electrical resistance of garments used to control electrostatic discharge. It covers procedures for measuring sleeve-to-sleeve and point-to-point resistance.

ESD STM3.1-2000: Ionization
Test methods and procedures for evaluating and selecting air ionization equipment and systems are covered in this standard. The document establishes measurement techniques to determine ion balance and charge neutralization time for ionizers.

ESD SP3.3-2000: Periodic Verification of Air Ionizers.
This Standard Practice provides test methods and procedures for periodic verification of the performance of air ionization equipment and systems (ionizers).

ESD S4.1-1997(Revised): Worksurfaces – Resistance Measurements
This Standard establishes test methods for measuring the electrical resistance of worksurface materials used at workstations for protection of ESD susceptible items. It includes methods for evaluating and selecting materials, and testing new worksurface installations and previously installed worksurfaces.

ESD STM4.2-1998: Worksurfaces - Charge Dissipation Characteristics
This Standard Test Method provides a test method to measure the electrostatic charge dissipation characteristics of worksurfaces used for ESD control. The procedure is designed for use in a laboratory environment for qualification, evaluation or acceptance of worksurfaces.

ESD STM5.1-1998 Revised: Electrostatic Discharge Sensitivity Testing -- Human Body Model
This Standard Test Method updates and revises an existing Standard. It establishes a procedure for testing, evaluating and classifying the ESD sensitivity of components to the defined Human Body Model (HBM).

ESD STM5.2-1999 (Revised): Electrostatic Discharge Sensitivity Testing -- Machine Model
This Standard establishes a test procedure for evaluating the ESD sensitivity of components to a defined Machine Model (MM). It also provides a system of classifying the sensitivity of these components. The component damage caused by the Machine Model is often similar to that caused by the Human Body Model, but it occurs at a significantly lower voltage.

ESD STM5.3.1-1999: Charged Device Model (CDM)-Component Level
This Standard Test Method establishes the procedures for testing, evaluating, and classifying the ESD sensitivity components to a defined charged device model.

ESD S6.1-1999: Grounding -- Recommended Practice
This Standard recommends the parameters, procedures, and types of materials needed to establish an ESD grounding system for the protection of electronic hardware from ESD damage. This system is used for personnel grounding devices, worksurfaces, chairs, carts, floors, and other related equipment.

ANSI ESD S7.1-1994: Floor Materials -- Resistive Characterization of Materials
Measurement of the electrical resistance of various floor materials such as floor coverings, mats, and floor finishes is covered in this document. It provides test methods for qualifying floor materials before installation or application and for evaluating and monitoring materials after installation or application.

ANSI ESD S8.1-1993: ESD Awareness Symbols
Three types of ESD awareness symbols are established by this document. The first one is to be used on a device or assembly to indicate that it is susceptible to electrostatic charge. The second is to be used on items and materials intended to provide electrostatic protection. The third symbol indicates the common point ground

ESD S9.1-1995: Resistive Characterization of Footwear
This Standard defines a test method for measuring the electrical resistance of shoes used for ESD control in the electronics environment.

ESD SP10.1-2000: Automated Handling Equipment
This Standard Practice provides procedures for evaluating the electrostatac environment associated with automated handling equipment.

ANSI ESD S11.11-1993: Surface Resistance Measurement of Static Dissipative Planar Materials
This Standard defines a direct current test method for measuring electrical resistance. The Standard is designed specifically for static dissipative planar materials used in packaging of ESD sensitive devices and components.

ESD STM11.12-2000: Volume Resistance Measurement of Static Dissipative Planar Materials
This Standard Test Method provides test methods for measuring the volume resistance of static dissipative planar materials used in the packaging of ESD sensitive devices and components.

ANSI ESD S11.31-1994: Evaluating the Performance of Electrostatic Discharge Shielding Bags
This Standard provides a method for testing and determining the shielding capabilities of electrostatic shielding bags.

ESD STM12.1-1997: Seating-Resistive Characterization
This Standard provides test methods for measuring the electrical resistance of seating used to control ESD. The test methods can be used for qualification testing as well as for evaluating and monitoring seating after installation. It covers all types of seating, including chairs and stools.

ESD STM13.1-2000: Electrical Soldering/Desoldering Hand Tools
This Standard Test Method provides electric soldering/desoldering hand tool test methods for measuring the electrical leakage and tip to ground reference point resistance and provides parameters for EOS safe soldering operation.

ANSI ESD S20.20-1999: Standard for the Development of an ESD Control Program
This Standard provides administrative, technical requirements and guidance for establishing, implementing and maintaining an ESD Control Program.

ESD STM97.1-1999: Floor Materials and Footwear – Resistance in Combination with a Person. This Standard Test Method provides for measuring the electrical resistance of floor materials, footwear and personnel together, as a system.

ESD STM97.2-1999 Floor Materials and Footwear Voltage Measurement in Combination with a Person.
This Standard Test Method provides for measuring the electrostatic voltage on a person in combination with floor materials and footwear, as a system.

Advisory Documents

Advisory Documents are not Standards, but provide general information for the industry or additional information to aid in better understanding of Association Standards.

ESD ADV1.0-1994: Glossary of Terms
Definitions and explanations of various terms used in Association Standards and documents are covered in this Advisory. It also includes other terms commonly used in the ESD industry.

ESD ADV3.2-1995: Selection and Acceptance of Air Ionizers
This Advisory document provides end users with guidelines for creating a performance specification for selecting air ionization systems. It reviews four types of air ionizers and discusses applications, test method references, and general design, performance and safety requirements.

ESD ADV11.2-1995: Triboelectric Charge Accumulation Testing
The complex phenomenon of triboelectric charging is discussed in this Advisory. It covers the theory and effects of tribocharging. It reviews procedures and problems associated with various test methods that are often used to evaluate triboelectrification characteristics. The test methods reviewed indicate gross levels of charge and polarity, but are not necessarily repeatable in real world situations.

ESD ADV53.1-1995: ESD Protective Workstations
This Advisory document defines the minimum requirements for a basic ESD protective workstation used in ESD sensitive areas. It provides a test method for evaluating and monitoring workstations. It defines workstations as having the following components: support structure, static dissipative worksurface, a means of grounding personnel, and any attached shelving or drawers.

Technical Reports

ESD TR01-99: Can Static Electricity be Measured?

ESD TR02-99: High Resistance Ohmmeters – Voltage Measurements

ESD TR03-99: Glove & Finger Cots

ESD TR04-99: EOS Safe Soldering Iron Requirements

ESD TR 05-00: Consideration for Developing ESD Garment Specifications

ESD TR 06-00: Static Electricity Hazards of Triboelectrically Charged Garments

ESD TR 07-00: Calculation of Uncertainty Associated with Measurement of Electrostatic Discharge (ESD) Current

ESD TR 08-00: Socket Device Model (SDM) Tester

ESD TR 09-00: Transient Induced Latch-Up (TLU)

ESD TR 20.20: ESD Handbook
New handbook provides detailed guidance for implementing an ESD control program in accordance with ANSI/ESD S20.20.

Working Group Activities

Wriststraps WG-1 reviewed and addressed several issues contained in its draft technical report on constant monitors.

Ionization WG-3 continued work on a technical report covering alternate test methods to the charged plate monitor for determining discharge time and offset voltage in ionizers. The group is discussing a variety of issues including plate size, voltage levels, and instrumentation.

Worksurfaces WG-4 reviewed comments on its draft technical report "A Survey of Static Control Worksurfaces and Grounding Mechanisms." Additional commentary on the draft will be reviewed at the May meeting series.

Human Body Model Device Testing WG-5.1 concluded that the test data for alternative methods of measuring high pint count devices was inconclusive for the preparation of a proposed technical report. In addition, the group concluded that any proposed changes to the existing HBM standard are of a minor nature and that the existing document could be sent to ANSI. The group also worked on the next revision of the HBM document.

Machine Model Device Testing WG-5.2 completed its review of a proposed technical report discussing the reasons for not reducing the number of pulses per stress level from three to one and reducing the time between pulses from 1 second to 0.5 seconds. Because industry focus seems to indicate a shift in emphasis from MM to CDM, the group will be examining these industry trends to determine the future direction for machine model work.

CDM Device Testing WG-5.3.1 defined the focus and issues to be addressed in the next revision of the CDM document. The group completed the preparation and working group presentation of individual "white papers" discussing -and limiting- the important issues. Next a "CDM workbook" that links the identified issues to specific STM 5.3.1 sections with requested or required updates will be created.

Socket Discharge Model (SDM) Device Testing WG-5.3.2 is developing a draft standard practice document based on the 1994 draft document and the technical report prepared in 1999. The goal is to have a draft document ready for comment and review at the September meeting series.

Transient Latch-Up Device Testing WG-5.4 completed an initial draft standard practice covering transient latch-up and anticipates having a final version for review in May.

Flooring WG7 continued its 5-year review of the existing flooring standard, the working group has developed generic descriptions for the three types of meters that would be used for resistance measurements in the document: laboratory, acceptance, and auditing instruments. The group had earlier discussed including resistance measurements made at 10 volts in the document, but has removed this requirement.

Footwear WG-9 has prepared an initial draft of a standard for measuring the electrical resistance of foot grounders and has forwarded the draft to TAS for review. The group is discussing whether there should be a standards document covering footwear testers.

Handlers WG-10 reviewed the grounding, ionization, and EMI content of its technical report. Sections on low voltage, low field and low resistance will be added in time for completion of a final draft by the May meeting series.

Packaging WG-11 reviewed a proposed draft of a revised EIA-541 document. Two Point Resistance (Packaging) WG-11.13 has constructed a second probe for taking two-point resistance tests for evaluation and comparison to existing procedures. Loose Fill (Packaging) WG-11.14 is reviewing and evaluating data from a second round robin test. The 5-year review of ANSI/EOS/ESD11.11 is in process and should be completed by the May meeting series.

Handtools WG-13 is selecting additional handtools used at work stations and will be conducting resistance testing of them. This preliminary work will help establish the validity of test procedures.

Simulators 14 completed an initial draft of its initial document and has begun work looking at radiated measurement technology.

Gloves WG-15 completed initial resistance testing of gloves using the procedures of S11.11 and S11.12. Additional analysis of the data and a review of the variables affecting the measurements are underway.

Workstations WG-53 is conducting a 5-year review of the existing standard. The group is revising some of the existing artwork in the document and expects to complete a revised draft for review by the May meeting series.

Cleanrooms WG-55 has nearly completed its technical report is nearly complete, which should be ready for publication in late spring. The group is also working on future additions covering cleaning materials, garments, and packaging that may be added as addenda at a later date.

Glossary

A revision of the *ESD Glossary* is targeted for completion in the fall.

Handbook

A revised ESD Handbook, *ESD TR 20.20* is ready for distribution.

Working Group	Chair
1.0 Wrist Straps	Brent Beamer, Static Control Components
3.0 Ionization	Rick Rodrigo, Simco
4.0 Worksurfaces	Dale Parkin, IBM
5.0 Device	Koen Verhaege, Sarnoff Corporation
5.1 Human Body Model	Mike Chaine, Micron Technology
5.2 Macine Model	Mark Kelly, Delphi Delco
5.3.1 Charged Device Model	Koen Verhaege, Sarnoff Corporation
5.3.2 Socketed Device Model	Mike Chaine, Micron Technology
5.4 Transient Latch-up	Gary Weiss, Lucent Technologies
7.0 Floor Materials	Paul Petersen, 3M
9.0 Footwear	Dale Parkin, IBM
11.0 Automated Handlers	Joe Bernier, Intersil Corporation
13.0 Handtools	Harry Joliff, TRW
14.0 Simulators	Don Lin, Lucent Technologies
20.20 ESD Control Program	Dave Leeson, Motorola; Steve Gerken, USAF
53.0 Workstations	Tim Jarrett, CPI-Guidant
97.1 Footwear/Floor Systems – Resistance	Paul Petersen, 3M
97.2 Footwear/Floor Systems – Charge Generation	Gene Chase, ETS
55.0 Cleanroom Consideratons	Tom Albano, Eastman Kodak
15.0 Gloves/Finger Cots	Gene Chase, ETS

For information on membership on the Standards Committee or one of the Working Groups, contact the Standards Committee Chair or the appropriate Working Group Chair through ESD Association headquarters.