September 2025 Standards Summary Session

Additional Information

- For more information on the Standards Business Unit and the standards development process, please visit https://www.esda.org/standards/standards-working-groups/#references > Standards Development Presentation.
- A copy of these slides will be posted on our website <u>https://www.esda.org/standards/standards-working-groups/#references</u> > Standards Activity Summaries.
- For more information on recent WG activities, please visit <u>https://www.esda.org/standards/standards-working-groups</u> > Committees Drop Down Menu.

WG 1 –Wrist Straps

Currently published documents

- ANSI/ESD S1.1-2021 Wrist Straps
- ESD TR1.0-01-01 Survey of Constant Monitors for Wrist Straps

Summary of discussions/activities/document reviews during the most recent WG meeting.

- ANSI/ESD S1.1 "Wrist Straps":
 - WG discussed the proposed changes (removal of non-ESD-related parameters such as break-away force) in the document controversially.
 - Consensus to move test procedures for mechanical parameters and limits into (normative) Annex and remove procedures for acceptance testing.
 - Further technical changes:
 - Include test procedures for dual-wire wrist straps.
 - Include verification methods for setups for ESD-related test procedures. ANSI/ESD SP17.2 "Process Assessment of Electrical Disturbances".
 - Update boilerplates, reporting section, and outline as decided in TAS/Manufacturing TT.
 - Timeline:
 - Update of document for 2026 March Meeting Series by WG chair.

WG 2 – Garments

Currently published documents

- ANSI/ESD STM2.1-2018 Garments
- ESD TR2.0-01-00 Consideration for Developing ESD Garment Specifications
- ESD TR2.0-02-00 Static Electricity Hazards of Triboelectrically Charged Garments

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Discussed a high-level overview of the document's 5-year review status.
 - Target for release Late 2026/Early 2027
- WG finalized discussions on verification of test setups and updates/consolidation of figures (incl. how to address garment pockets).
- WG will have full review this fall with target to adjudicate comments at the March meetings.

WG 3 - Ionization

Published Documents

- ANSI/ESD STM3.1-2024 Ionization
- ANSI/ESD SP3.3-2016 Periodic Verification of Air Ionizers
- ANSI/ESD SP3.4-2016 Periodic Verification of Air Ionizers Using a Small Test Fixture
- ANSI/ESD SP3.5-2020 Air Assist Bar Ionizers, Soft X-Ray (Photon) Ionizers, Room Ionization Alternatives, and Non-Airflow Alpha Ionizers

Summary of discussions/activities/document reviews during the most recent WG meeting:

- Due to the large group, many of whom have not been involved in discussions before, we reviewed the history of STM3.1 and some of the problems with the current version of the document.
- Reviewed first lab data using the current procedure, three benchtop blowers (one AC, two SSDC).
- Discussed who to send the blowers to next and developed a plan for that.
- Lots of discussion on how to test overhead blower units and whether this procedure could be used for air assist bar ionizers (such as those used in EFEM's).

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WG 4 – Worksurface

Currently published documents

- ANSI/ESD STM4.1-2017 Worksurfaces Resistance Measurements
- ESD TR4.0-01-02 Survey of Worksurfaces and Grounding Mechanisms

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Technical Report on Conveyors Resistance Measurements:
 - The focus of the meeting was to continue the work on the Technical Report.
 - How are the ESDS items being transported on the conveyor?
 - Are they being used as a worksurface?
 - What is the risks of the different types of conveyors being used,
 - What resistance measurements are done and how to perform these measurements
 - How to mitigate the risk.
- A write-up on the Metal Mesh Conveyor was provided and presented. There
 was a discussion on testing of the conveyors. A good baseline for each of the
 other conveyor types.
 - All test equipment used for testing the different conveyors will be put into one section.
- A presentation and discussion on Impedance testing of conveyors to ground.

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WG 5 – Device Testing

Currently published documents

ANSI/ESD SP5.0-2023 - Reporting ESD Withstand Levels on Datasheets

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Discussed updating JEDEC JEP178 to align with the updated ANSI/ESD SP5.0
 - Team agreed that an update is needed and better alignment with JEP178 will be needed in the future
 - Scott Ward to start this discussion in the September JEDEC meeting series
 - WG5 will open and start the 5-year review early so that any updates to SP5.0 will also be incorporated into JEP178
- Technical report on curve tracing
 - The outline reviewed with the WG no additional items added
 - 3 new writing team members added (13 total members)
 - David Klein agreed to champion the TR writing team meeting will be planned in the Oct/Nov timeframe

JWG HBM

Currently published documents

- ANSI/ESDA/JEDEC JS001-2023 Human Body Model (HBM) Device Level
- ESD JTR001-01-12 User Guide of ANSI/ESDA/JEDEC JS-001 Human Body Model Testing of Integrated Circuits
- ANSI/ESD SP5.1.3-2022 Human Body Model (HBM) A Method for Randomly Selecting Pin Pairs
- ANSI/ESD SP5.1.4-2024 Random Supply Sampling (two-channel tester)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Agreement on significant changes to pin classifications in JS-001
 - Supply group definitions and shorted (supply and non-supply) group definitions
 - Cloned IO pin definitions and treatment

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JWG HBM

- 2 terminal testing. Review of provisions in JS-001 for 2 terminal testing.
- Limited study on correlation between relay-based and 2 terminal testers.
- Treatment of a device made up entirely from previously qualified components
- Review of the possibility for more problematic spurious pulses at low stress levels.
- Discussion about different results obtained with two different but compliant test systems
- 10k charge removal shunt resistor and how it affects high impedance device pins
- Powered HBM Testing
- Adoption of WG5.0 Failure definitions and allowed devices for testing (fresh parts)
- Feedback on pin-pair stress (10 pins or less)
- Action item review of Shall May Can Should within JS-001.
- Continuity testing should JS-001 address this?

JWG CDM

Currently published documents

- ANSI/ESDA/JEDEC JS-002-2022 Charged Device Model (CDM) Device Level
- ESDA/JEDEC JTR002-01 CDM User Guide
- ANSI/ESD SP5.3.3-2018 Low Impedance Contact CDM (LICCDM)
- ANSI/ESD SP5.3.4-2022 Capacitively Coupled Transmission Line Pulsing as an Alternative CDM Characterization Method
- ESD TR5.3.1-01-18 Contact Charged Device Model (CCDM) Versus Field Induced CDM (FICDM) A Case Study

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Technical report on bare die testing: second draft to be reviewed by WG by mid-November
- CC-TLP RR study is going on (verification of lab internal current variation)
- LI-CCDM RR: single lab experiment planned to prepare RR experiment
- AEC Harmonization (1 zap vs 3 zaps): contact established by the end of October
- 3 presentations (device testing, CDM Modeling, device physics under CDM conditions)

WG 5.5 - Transmission Line Pulse (TLP)

Currently published documents

- ANSI/ESD STM5.5.1-2022, the standard test method for (VF-)TLP
- ESDTR5.5-04-23, the user and application guide for (VF-)TLP
- ESDTR5.5-05-20, technical report on transient analysis with TLP
- 3 older technical reports

Summary of discussions/activities/document reviews:

- SP on Transient Analysis with VF-TLP (WIP5.5.3):
 - Leonardo Di Biccari (STM) summarized status of the writing team and proposed new outline of the document. The writing team was extended with 3 new members.
 - Wei Huang (ESDEMC) shared VF-TLP and VNA measurements. The VF-TLP data is much in line with earlier data contributed by other companies, but the rise time of their VF-TLP seems a bit higher. The data and effect of rise time is to be compared by writing team.
 - The VNA data is not completely understood and needs to be worked out in more detail.
- Leonardo analyzed an earlier reported difference in the peak voltage in the measurement results provided by STM and NXP for a 12 nH inductor. Each data set is consistent in itself. Possibly the deviation is caused by probe position on the chuck. NXP and STM are doing experiment by varying probe/sample position.
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WG 5.5 – Transmission Line Pulse (TLP)

- TR on Statistical Application of TLP (TR5.5-06):
 - Theo Smedes (NXP) shared several data collections measured with a non-Kelvin TLP/VF-TLP set-up and showed the advantages of Kelvin. Also, the effects of repeated probing on the statistical distribution were illustrated.
 - Wei shared data for comparison with the results that other companies provided earlier.
 - Both sets of data will be folded into the TR.
 - Theo discussed the status of the TR. The WG review comments adjudication is more than 80% complete. All addressed comments will be incorporated in the revision for TAS. Selected papers will be divided among all WG members to write summaries for the literature chapter. The revised version is planned to be ready by the end of the year.

WG 7 - Flooring

Currently published documents

- ANSI/ESD STM7.1-2020 Flooring Systems Resistive Characterization
- ESD TR7.0-01-23 Protective Flooring Systems

Summary of discussions/activities/document reviews during the most recent WG meeting.

- STM 7.1 Revision Status
 - Waiting for STDCOM comments. Not yet available. Will meet virtually to adjudicate. Hope to have it done in the next two months.

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WG 7 - Flooring

- Informative Piece Presentation of walking voltage vs system resistance
 - Findings of samples showed that system resistance should be lower than 10^8.
 This will help generate walking test results that are less than 100V
 - Most footwear on dissipative flooring samples exceeded 100 volts at 12RH%
 - With this data, are we convinced that the 10^9 limit for flooring is applicable for the standards?
 - While not investigated in this study, there are systems with resistance in the high 10^8 range that tribocharge less and will meet the 20.20 requirements.
 - A person will always tribocharge
 - Wrist Strap keeps you at 1meg
 - The F/F system is not always connected to ground, you are tribocharging and trying to discharge.
 - Conduct another Test.
 - What is the source of the charges? What is the dominant source? and what is the drain? Keith wants to create an apparatus to test the footwear/flooring systems to take the human body out of the test.

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WG 7 - Flooring

Meter Accuracy Considerations

- We discussed what type of accuracy was desired. Keith reported that he likes to see 1/3 of a decade as the desired measurement of accuracy. This equates to a 30% accuracy. Most other end-users in the group seemed to be in agreement with this.
- Dave says uniformity of the electrodes is very important. Variability of the rubber on the electrodes.
- The precision at the end of the decade is not true.
- We discussed what causes variability in the readings. Factors include variability in the
 materials being tested, variability caused by the charge sent through the flooring
 system, and variability in energizing timing, which causes variability in how the meter
 calculates resistance.
- No percentage of accuracy in the boilerplate
- Tom presented the stated accuracy of 4 meters in the market. These ranged from 2% to 20%
- Tom shared some test results of a floor acceptance test. Readings ranged from 1x10^5 to 1x10^6.
- Chris Almeras has measurements on his epoxy flooring that he is going to review and share. His quick assessment was that he saw a similar range of readings, approximately one decade.
- We had a very brief conversation about the value of doing some round robin testing of meters.

WG 11- Packaging

Currently published documents:

- ANSI/ESD S11.4 Bags
- ANSI/ESD STM11.11 and 11.12 Surface and Volume Resistance
- ANSI/ESD STM11.13 Two-Point Probe
- ANSI/ESD S541 Packaging
- ANSI/ESD STM11.31 Bags Discharge Shielding

Summary of discussions/activities/document reviews during the most recent WG meeting.

- STDCOM review comments were adjudicated
 - This document should be submitted to Christina by December
- WG began to adjudicate TAS comments on ESD WIP11.31. The document requires a couple more changes and will then be submitted and presented in March to WG
- Reviewed suggested changes to ESD WIP11.13 during the five-year review. A few more changes are needed, and then the document will be circulated for WG comments.
- Started the five-year review of ANSI/ESD STM11.11 and ANSI/ESD STM11.12. Work is needed in the task team evaluating different concentric rings and using parallel bar electrodes.

WG 12 – Seating

Currently published documents

ANSI/ESD STM12.1 "Seating – Resistance Measurements" (2019)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- ANSI/ESD STM 12.1 "Seating Resistance Measurements"
 - WG discussed and adjudicated comments from Industry Review
 - At least one comment is a technical change, resulting in a new STDCOM VBM
- Discussed topics for further work in WG 12:
 - Clarify the need for resistance measurements of all components of a chair
 - Consider extending the scope of the document to metal chairs
 - Consider adding other "seating objects"
 - Give guidance on the measurement of the backrest
 - Give guidance on the measurement of drag chains

WG 13 – Hand Tools

Currently published documents

- ANSI/ESD S13.1-2019 Electrical Soldering/Desoldering Hand Tools
- ESD TR13.0-01-99 EOS Safe Soldering Iron Requirements

Summary of discussions/activities/document reviews during the most recent WG meeting.

- WG reaffirmed that redesignation of ANSI/ESD S13.1 to an STM is useful; all limits are defined in ANSI/ESD S20.20.
 - However, ANSI/ESD S13.1 may be fast-tracked to IEC TC101, and as IEC 61340-5-1 does not define limits for soldering/de-soldering irons, WIP13.1 will remain a standard for the moment. It will be redesignated later (no round-robin required).
- Discussion on facility power cleanliness and effects on soldering tools (EMI), and if current measurements address this. No action to be taken at this time.

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WG 13 – Hand Tools

- There was a good discussion on the test electrode and the description of the specimen. WG decided to remove the statement "single-sided or double-sided" along with a few other words in the related paragraph. WG Chair to take another look at how the description is worded during postmeeting updates.
- WG continued discussion of the main technical concern: The accuracies defined for the instruments do not match verification procedures and are not aligned between procedures; verification procedures in the document and the Annex are not aligned. WG Chair to take a deeper look and address in the post-meeting changes. Will present to the group in an early 2026 virtual meeting to further discuss.
- WG highlights the increased importance of battery-operated soldering/ desoldering irons and other battery-powered hand tools. Discussed addition of a note to 13.1 for statement of direction to address batterypowered hand tools (likely in a separate document).

WG 14 - System Level

Currently published documents

- ANSI/ESD SP14.5-2021 Near Field Immunity Scanning Component/Module/PCB Level (EMC/ESD Scanning)
- ESD TR14.0-01-00 Calculation of Uncertainty Associated With Measurement of Electrostatic Discharge (ESD) Current (Formally TR-07-00)
- ESD TR14.0-02-13 System Level Electrostatic Discharge (ESD) Simulator Verification (Formally SP14.1)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- SP14.5 EMC Scanning, 5-year review
 - The document was sent to members for review and comments were received
 - It was suggested that "users" of the document be asked to review the comments to determine
 whether these suggested changes would actually improve the document.
 - Reviewer provided their comment and these will be used to determine whether the SP needs to be changed.
 - The reviewer suggested that it would be best to promote the SP by writing articles and place them in multiple publications to reach a wider audience
 - Work will be done on these articles

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WG 14 - System Level

- SL-DPE (System Level Direct Pin ESD)
 - During recent meetings, we discussed a number of "older" standards that discussed direct pin injection.
 - IEEE C62p38-1994
 - ANSI/IEEE C63.16-2016
 - Robert Ashton presented a review of the IEEE C62p38-1994 document, which
 was withdrawn some time ago. His assessment was that this document did
 not offer a complete test method and isn't relevant for the work we are doing.
 - Robert also presented a summary of his thoughts on what would be required or cautioned when looking at creating a test method for SL-DPE.
 - This led to discussions on SL-DPE testing and thoughts on where to go within the WG.
 - Update on where the Industry Council is on the work they're doing on SL-DPE
 - A White Paper is being written by the Council
 - Goal is to provide insight into SL-DPE
 - A summary of the learnings from the Survey
 - Provide a standard unified "methodology" for performing SL-DPE
 - What's next?
 - Await further inputs from the Industry Council to see what WG14 has to say before moving forward with the development of any test method for direct pin injection

WG 17 – Process Assessment

Currently published documents

- ANSI/ESD SP17.1, "Process Assessment Techniques" (2020)
- ANSI/ESD SP10.1, "Automated Handling Equipment (AHE)" (2016)
- ESD TR17.0-01-15, "For ESD Process Assessment Methodologies in Electronic Production Lines – Best Practices Used in Industry" (2015)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- ANSI/ESD SP17.1 Rev. 2:
 - STDCOM review: All comments of the STDCOM review adjudicated.
 - At least one comment is technical; a new STDCOM VBM is required.

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WG 17 – Process Assessment

- ANSI/ESD SP17.2 "Process Assessment of Electrical Disturbances":
 - Presentation by Vladimir Kraz on risk of EMI and Semi E.176.
 - Discussion in working group on whether SEMI E.176 can be "adopted" or whether an own document should be started. Consensus that it would be beneficial to start with the Semi E.176 document. A discussion between ESDA and Semi is required.
- Technical Report on Application of ANSI/ESD SP17.1:
 - Will be a teaching document on accomplishing ANSI/ESD SP17.1 assessments.
 - Reviewed and agreed upon the basic outline of the document content and the timeline.
 - Document timeline:
 - WG agreed on the outline of the document, with drafts of contributions expected by September 2025

 some contributions are still missing.
 - WG plans to start review in December 2025.
- Presentation by Ellen Merkel on "ESD Discharge Measurements in Automated Handlers" (EOS/ESD Symposium paper) gives interesting insight into the distribution of discharge current peak currents in automated handlers. Further work planned, highly interesting for WG 17.

WG 18 - EDA

Currently published documents

- ESD TR18.0-01-14 ESDA Technical Report for ESD Electronic Design Automation Checks
- ESD TR18.0-02-20 ESDA Technical Report for Latch-Up Electronic Design Automation

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Bi-weekly virtual meetings
- New version of ESD TR18.0-01
- Ongoing cooperation with
 - WG22 to the new version of TR22.0-02
 - 3D Integration and Advanced Packaging Task Team
 - ESD roadmap at each new version
- Upcoming activities
 - new cooperations: TR on SPICE and Compact Modeling and on TCAD
 - Complementary document of verified rules

WG 18 - EDA

- New version of ESD TR18.0-01:
 - Received second TAS review > completion of last items by ww42
 - Final step: publication
- Cooperation with WG22 to new version of TR22.0-02 (ESD parameters from IP providers)
 - Completed inputs table and included in appendix
- Contribution in ESD Roadmap 2026
 - Presentation at the EOS ESD Symposium 2025 of EDA updates contained in the new roadmap
- Upcoming activities:
 - Creation of TRs on SPICE and Compact Modeling and on TCAD
 - Preliminary discussions held at the EOS ESD Symposium 2025
 - First virtual meeting to discuss about TR on SPICE and Compact Modeling > October 23
- Completion of a document complementary to ESD TR18.0-01 containing:
 - Physical explanation of each ESD violation checked with a specific rule described in TR18.0-01
 - For each rule described in the TR18.0-01, correspondence with check type, checked database, and reference to the case studies

WG 19 – High Reliability

Currently published documents

 ESD TR19.0-01-22 Protection of High-Reliability Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- The initial part of the meeting was primarily updating the committee on the progress the writing team had made in developing the new requirements and the philosophy behind the requirement categories selected. The type, number of requirements developed, and definition of the categories are as follows:
 - Administrative Recommendations (21) These are the industry best practices or recommended processes for managing a high-reliability ESD control program.
 - Administrative Requirements (20) These are required processes, documents, or other elements used to manage a high-reliability ESD control program that are more system-based than direct protection of hardware.
 - Technical Recommendations (14) There are industry best practices or recommended processes, equipment, or systems used to protect ESDS items in a high-reliability ESD control program.
 - Technical Requirements (15) These are the required processes, equipment, or systems used to protect ESDS items in a high-reliability ESD control program. Every requirement includes a rationale and mitigates a risk.

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WG 19 – High Reliability

- The next part of the meeting was spent discussing the process used to develop the requirement set using the initial outline draft as the baseline.
 The criteria for development included:
 - Every requirement includes a rational and mitigates a risk
 - Every requirement contains a shall/should statement
 - Every requirement identifies the evidence for verification
 - Every requirement identifies the target of the requirement
 - Written as "requirement target" + "shall/should" + "requirement/action"
 - Every requirement is mapped to one of the four High Reliability tenets
 - Every requirement has been mapped to a High Reliability process step and control program element

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WG 19 – High Reliability

- Following the review of criteria for requirement development, review of the requirement spreadsheet began along with discussion and updating of requirements. There was considerable discussion on multiple requirements, but most resolutions were considered sufficient for this stage of the document development.
- Prior to ending the meeting, an action for the group was set to review the currently developed requirement and to provide feedback to the committee, as well as any recommended requirements that should be added based on best practices at their facility. The due date for this action is October 31st, and virtual meetings to continue reviewing the draft requirements will be scheduled thereafter.

WG 20 - ESD Control

Currently published documents

- ANSI/ESD S20.20-2021 Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)
- ESD TR20.20-2016 ESD Handbook

Summary of discussions/activities/document reviews during the most recent WG meeting.

- The WG is starting the five-year review of ANSI/ESD S20.20. Discussions include:
 - Addition of gloves
 - Clarification on tailoring
 - Tolerance on RH

WG 22 – ESD Parameters

Currently published documents

- TR22 0-01-14 Relevant ESD Foundry Parameters for Seamless ESD Design and Verification Flow
- TR22 0-02-18 Relevant ESD Parameters for Seamless ESD Design and Verification Flow
 Part 2 ESD Parameters from IP providers

Summary of discussions/activities/document reviews during the most recent WG meeting.

- We did not have a f2f meeting at Riverside this time. Though the group had few virtual meetings in the last months, with the main focus on the 2nd revision of 'TR22-0-02-18'. WG22 collaborates with WG18 regarding using EDA tools to ensure the seamless integration of IPs from the ESD perspective. The goal is to submit the draft of the new revision to TAS this year.
- TR22-0-01-14 status: All TAS comments were answered. The updated document has been reviewed again by TAS, and we will get the new comments in October to adjudicate.
- Efraim gave an invited talk at the 6th India ESD Workshop about foundry ESD deliverables and ESD characterization.
- The WG22 technical reports will be mentioned in a tutorial on ESD characterization in the EOS/ESD2025 symposium. The tutorial will also include a brief review of the reports, their scope, and content.

WG 26 – System Level ESD Models

Currently published documents

- ESD TR26.0-01-23 Behavioral IC Modeling to Perform System Level ESD Simulations – General Description and Trends
- ESD TR26.0-02-24 Quasistatic Model Definition Building Model

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Does it make sense to simulate the PCB in 3D to extract the inductances?
- Rise times of 0.6ns/1ns and a maximum pulse duration of up to 100ns are sufficient for the moment. Faster rise times for Cable Discharge Events and Surge modeling can be added later. All of this would add more effort and delay the document.
- A TR can always be amended easily (only needs to go through TAS), and these topics can be added later
- Certain sections of TR26.02 revised can already be started to be written.

WG 53 – Compliance Verification

Currently published documents

ESD TR53-01-22 – Compliance Verification

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Document designation elevation from TR to SP (ANSI/ESD SP TR53), to add ANSI designation. Related to the use of TR53 within certain organizations.
- History of TR53 and IEC 61340-5-4.
- Comparison and review of IEC 61340-5-4 (TR53 equivalent).
- Goal is harmonization of test equipment terms and definitions.
 - Examples Protected Earth and AC Equipment Ground (Equipment grounding conductor), functional ground, and auxiliary ground.
- Alignment on technical procedures where possible.
- Discussed the potential for additional annexes related to test equipment verification, how and where to reference them in the document, etc.

WG 97 – Footwear/Flooring

Currently published documents

- ANSI/ESD STM97.1-2025 Footwear/Flooring System Resistance Measurement in Combination with a Person
- ANSI/ESD STM97.2-2016 Footwear/Flooring System Voltage Measurement in Combination with a Person

Summary of discussions/activities/document reviews during the most recent WG meeting.

- The WIP97.2 Footwear/Flooring System Voltage Measurement in Combination with a Person, was reformatted in the new boiler plate format.
- The document was sent out to the working group for review and comments.
- Received several comments back from the WG.
 - There were 12 technical comments and several editorial comments.
 - The 12 technical comments were reviewed by WG and accepted.
 - The WG started on the editorial comments. Which will be completed between the meeting, and the document will be sent out to the WG member for a final review before going to TAS for review.

Manufacturing Task Team

Currently published documents

(no document – decisions included in other documents and ESDA Style Manual)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Manufacturing TT approved suggestions for minor editorial changes in boilerplates for
 - Resistance measurement apparatus;
 - Controlled test environment;
 - Outline of documents
 - Add information on serial number(s) and/or lot(s) of the specimen(s) to the "should section" of the reporting section.
- Annex A.1 ("Verification of Measurement Set-up Verification of Resistance Measurement Apparatus"): Added a note to allow the use of resistors for meters with a broader range than required.
- Manufacturing TT agreed on terms for resistance parameters and usage of "may", "can", "should", and "shall".
- Manufacturing TT continued discussion on the accuracy of measurement equipment. Discussed that WG chairs need to be aware of where accuracy is essential and where it may not be.

Our next meeting is during the meeting series on March 16-20, in Las Vegas, NV. The full meeting schedule will be available in November on the website under Events.