

March 2026 Standards Summary Session

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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 <https://www.esda.org/standards/standards-working-groups/#references> > Standards Activity Summaries.
- For more information on recent WG activities, please visit <https://www.esda.org/standards/standards-working-groups> > Committees Drop Down Menu.

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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.

- Discussed moving the mechanical tests in S1.1 to an annex. The majority of participants supported this change. Therefore, the change will be implemented.
- Discussed whether adding a test method for 2-wire wrist straps is valuable to the industry. Participants supported adding this test method to the draft document.
- Discussed whether the TR on continuous monitors should be started again. This will be discussed again in June. Will need a writing team to begin. Likely to start after we submit S1.1 to TAS.

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 STM2.1's 5-year review status.
 - Target for release – Early 2027
- Reviewed and adjudicated comments from WG.
- Chair to finalize updates and submit STM2.1 to TAS for review NLT 5/31/26.

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:

- WG3 Reviewed the round-robin data from the first two labs
- After discussion, minor modifications were made to the test procedure
- Decision to continue with round-robin testing with European Labs
 - ESDA LLC to ship the ionizers to Wolfgang to coordinate the testing with several labs in Europe.

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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.

- ESD DSTM4.1 - Industry comments received and adjudicated. The next step is publication.
- Working Group reviewed the status of the TR - conveyors.
 - In the last meeting Wired Mesh Conveyors was added to the TR.
 - New sections added for Single Belt Conveyors, Edge Type Conveyors, and Roller Type Conveyors.
 - Each of these sections includes:
 - Introduction of the conveyor
 - Potential Risk
 - Measurement Equipment
 - Ground Measurement
 - Mitigation
 - Discussion:
 - Measurement and testing approaches
 - Risk and concerns for each one
 - Wafer shuttles and trays
- Test Procedures for resistance measurements for Point to Groundable Point and Point to Point will be added before the next meeting.

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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.

- Curve Trace TR5.0-01
 - The outline of the TR, as finalized with the writing team in February, was reviewed by the whole WG.
 - The WG agreed with the direction.
 - There are 6 major sections, and writers were assigned to all sections.
- 5yr review of WIP5.0
 - The 5yr review was opened early to identify all changes – this will enable the ESDA document to be synced with the JEDEC version (JEP178) once final edits have been made to the ESDA version.
 - A first pass review of the entire document was completed in the meeting, and edits were identified.
 - Brett to update the document and send it out to the WG for a more formal review – target by early May to start the review and review comments in June.

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JWG HBM

Currently published documents

- ANSI/ESDA/JEDEC JS001-2024 - Human Body Model (HBM) – Device Level
- ESD JTR001-01-25 – 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.

- How to stress a large MCM made of fully qualified dice according to JS-001.
- Table 2A treatment of a non-supply pin without an associated supply.
- IEC feedback on JS-001.
- Intention to start the 5-year review process for JS-001.

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JWG CDM

Currently published documents

- ANSI/ESDA/JEDEC JS-002-2025 – Charged Device Model (CDM) – Device Level
- ESDA/JEDEC JTR002-01-25 – 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.

- Q100 harmonization
 - AEC is willing to activate ESD subcommittees.
 - Need a Tier1 to be involved
 - Continue on pushing for WG activation.

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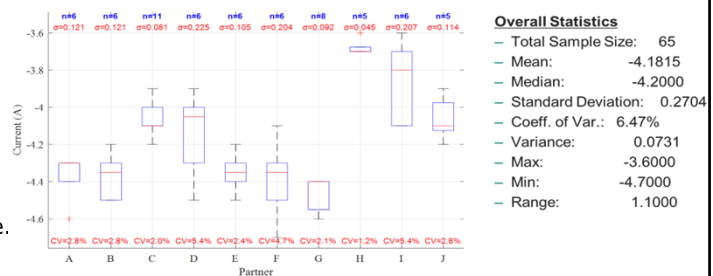
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JWG CDM Cont.

- Revision of the WG comment on TR5.3.1.
 - Some comments triggered the need to rewrite some sections
 - Section 6: now only presents different methodologies
 - Section 7: now includes discussion and comparison, and Pros/Cons
 - Section 9: discussion on moving toward new methodology for testing.
 - New outline and modification accepted.
 - Document will be sent out for Limited Ballot.
 - Expected to be sent to TAS by end of April.
- CC-TLP Round Robin
 - RR results show STDDEV <0.25 A within lab
 - Discussion on the reason for the difference between labs.
 - DUT sensitive to voltage across them (unexpected).
 - Evaluation of peak voltages to be done.
 - Long-term: STM writing team.
- LI-CCDM Round Robin Single lab experiment done.
 - Problem with current reading.
 - Voltage failure seems consistent.
 - Additional 2 labs verification.
- JS002/JTR002
 - WG shall propose by June any idea on possible modification/enhancement.
- Low voltage testing
 - Device found having 50V withstanding threshold.
 - RR will begin after previous RR closure.



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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:

- Adjudication of TAS comments and updating TR on Statistical TLP Applications started. The literature review section will be included. The goal is to have a WG-approved version ready for TAS review before the September meeting.
- Preparation of draft SP on Transient Analysis started with the goal to have WG review ready for adjudicating comments in the September meeting.
- Presentation from Advantest on powered ESD to replicate damage in testers with a request to develop a standard. The topic is recognized, and feedback will be shared with Advantest. Presentation will also be shared with the Industry Council (SL-DPE).
- Short discussion on 5-year review of STM5.5.1. The plan is to collect input from WG members for consideration in updating or reaffirming the document. Collected inputs to be discussed and decided in the September meetin.

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.

- Reviewed broad-stroke topics in the revision
- Adjudicated STDCOM VBM Comments:
 - Recording temperature and humidity for acceptance testing - do we need to record it for every 500 sq meters? WG concurred, yes, leave reporting requirements and example form as is
 - Annex A – Action: ensure the most current version of Annex A is included in the document
 - Definition of Conductive/Dissipative flooring "system" - discussion on whether or not the "system" should be point to ground or point to groundable point (current definition). Healthy discussion - consensus to leave as groundable point.
- WG7 is working on the 5-year revision of STM7.1. STDCOM recently completed its 30-day VBM and returned comments to the WG for adjudication. The WG completed that at today's meeting, and the document will be returned to STDCOM for an additional 15-day review.

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 completed a VBM on WIP541, comments were adjudicated during the meeting
 - This document should be submitted to Christina by May
- WG went over TAS comments on ESD WIP11.31. The document requires two additional items to be rewritten and returned to the WG for review.
- Discussed Concentric ring task team and what will be done. Hope to have some data by June.
- Started the five-year review of ANSI/ESD STM11.11 and ANSI/ESD STM11.12. Work is needed on the task team evaluating different concentric rings and the use of parallel-bar electrodes.
- Discussed MIL-PRF connector cap slough test.
- Discussed getting back into ADV 11.2 triboelectrification to update this
- Discussed the need to have an 11.14 tray testing spec for small area testing

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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.

- Work on ANSI/ESD STM12.1:
 - WG 12 discussed and approved suggestions for editorial and technical changes in boilerplates:
 - Specimen support surface
- WG 12 discussed and approved suggestions for editorial and technical changes in Annex A “Verification Procedure of Measurement Set-up”
 - Editorial changes
 - Resistor values for verification of the meter
 - Cleaning procedure
- Next steps: Update the document, send it to ESDA Operations to approve the document for publication.

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WG 12 – Seating Cont.

- Identify topics to be addressed in the next revision of ANSI/ESD STM12.1:
 - Clarify the need for resistance measurements of all components of a chair, particularly the footrest, etc.
 - Consider extending the scope of the document to chairs with a resistance to groundable point less than 1.0×10^4 ohms
 - Consider adding floor creepers or other “seating objects”
 - Give guidance on the measurement of the backrest
 - Add comments on usage of drag chains
 - Consider adding a “system test” (flooring included, no grounding) with increased resistance limits, for example, 1.0×10^{11} ohms

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.

- Clarified document intent around ESD-sensitive materials and safe work areas, including defining ESD and standardizing terminology (e.g., “ground” vs. safety/equipment ground).
- Debated measurement approaches—frequency range, impedance vs. resistance, and equipment tolerances—with agreement to simplify requirements (e.g., remove resolution details, align tolerances).
- Agreed on key updates: broaden frequency considerations, standardize grounding language, and maintain current measurement methods while evaluating future improvements.
- Identified next steps and actions, including revising the draft, proposing guidance on frequency range, aligning tolerances, and continuing work on hand tool documents.

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 - 5yr review status
 - The decision was made to reaffirm the document as is
 - Document will be finalized and re-released
- Direct Pin Injection Discussions (SL-DPE)
 - The Industry Council is continuing their investigation into the need for a system level direct pin ESD (SL-DPE) document, however they have expressed their desire to have the ESDA develop a test method for SL-DPE.
 - WG will wait for further information from the Industry Council before moving ahead with any document development.

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WG 14 – System Level Cont.

- Industry Council CBE discussion
 - Relating to lowered design threshold levels and the testing requirements for DDR memory devices, the Council is discussing these new requirements and how this may require a new test method using a CBE test method.
 - WG will wait for further information from the Industry Council before moving ahead with any document development.
- WG14 Status
 - Based on the above, it has been decided that the WG will go dormant till such a time that the Industry Council determines the requirements for a SL-DPE test method AND the Association agrees to take on this development.

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WG 15 – Gloves

Currently published documents

- ANSI/ESD STM15.1-2019 - Methods for Resistance Measurement of Gloves and Finger Cots
- ESD TR15.0-01-99 - ESD Glove and Finger Cots

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

- Team focused on TAS comments from the 5yr review of WIP15.1.
- A total of 73 comments received from TAS, 29 comments reviewed and addressed in the meeting.
- Further comments will be addressed offline, and the document will be sent to WG members for a final review before submitting to STDCOM.
 - May require a shortened TAS review – this is to be determined.

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.

- Work on ANSI/ESD SP17.1 “Process Assessment”:
 - 22 comments received from Industry Review, all comments discussed and adjudicated
 - Next steps:
 - Publication; expected by end-April 2026
 - Discuss parking lot items from WG review, STDCOM review, and Industry Identify topics to be addressed in the next revision of ANSI/ESD SP17.1

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WG 17 – Process Assessment Cont.

- Work on ANSI/ESD SP17.2 “Process Assessment of Electrical Disturbances.”
 - Focus of first part of document: “Grounding”; further parts will follow in next revisions
 - Document will follow the flow of ANSI/ESD SP17.1
 - Writing Team will meet between Meeting Series to define outline and assign sections to volunteers
- Work on ESD TR17.0-03 “ANSI/ESD SP17.1 Handbook”
 - 10+ process steps identified that will be addressed in the document
 - Next steps: Submission of drafts of process assessment of defined processes to WG Chairs; compile first draft for discussion in September WG Meeting
- Work on ESD TR17.0-02 “ESD Event Detection”
 - Only one contribution is currently missing, expected by the end of June 2026
 - Next step: Compile document for WG review by the end of July 2026; discuss WG comments in the September WG meeting

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WG 18 – EDA

Currently published documents

- ESD TR18.0-01-25 ESDA Technical Report for ESD Electronic Design Automation Checks (update released in January 2026)
- 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
- Upcoming activities
 - Tutorial on TR18.0-01-25, ongoing decision process if
 - Refreshing of the existing tutorial DD381: “Electronic Design Automation (EDA) Solutions for ESD”
 - Create a different tutorial addressed to EDA people new to ESD
- Cooperations:
 - ESD roadmap 2026 > ongoing updates to the EDA section
 - 3D Integration and Advanced Packaging Task Team

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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 used to update the committee on progress made by the writing team since the last face-to-face meeting in September.
 - Meetings were limited due to the government shutdown and holidays
 - Only 2 commenters provided feedback on the draft document and requirement spreadsheet, all of which were adjudicated by the writing team and will be presented to WG
- Most of the meeting was used to review draft requirements, rationale, and risk mitigation.
 - Focus of review was to ensure that requirement language was aligned to the rationale and risk being mitigated
 - There were some technical discussions to further refine the philosophy of developing this document, such as target audience, level of specificity for requirements, and language/terminology.
 - Additional plans are made to review the current document structure and to consider structuring the document based on the overall risk mitigated by a set of requirements

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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.

- Started to adjudicate the WG comments received on the 5-year review of ANSI/ESD S20.20
- Clarifications include
 - Tailoring
 - Exclusions to factory humidity qualifications
- Items to discuss at next meeting include
 - Change of scope, possible reduction in CDM targets
 - Add Gloves/Finger cots to table 3

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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.

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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.

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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.

- Goal - Harmonization of IEC 61340-5-4 and opportunities for improvements
 - Grounding/Bonding Terms, Definitions, and Symbols
 - Discussion on removing polarity recommendations for resistance measurements
 - Glove methods to move from the Appendix to the document body, based on ANSI/ESD S20.20 guidance.
 - Requirement to address non-compliant ESD control items from the EPA when found
 - Test equipment definitions, agreement to reinstate requirements as appropriate.
 - Discussion on figures used for measurements of insulators, no changes recommended.
 - Seating discussion related to including additional optional measurements (back, arms, etc.) No changes recommended.
 - Worksurface test equipment/procedure, no changes recommended
 - Harmonize on CPM plate terms per guidance of WG3 (Isolated Conductive Plate)
 - Packaging, agreement to add a statement regarding resistance measurement applicability as related to ESD shielding effectiveness.

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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.

- WG started the review of 147 technical and editorial TAS comments on 97.2.
- WG reviewed and discussed the new Annex B – (INFORMATIVE) - Discussion on the value of ANSI/ESD STM97.2 graphs. This new annex is intended to help users understand the importance of the graphs/charts and the information required for reporting the test results. In addition, without the graphs/charts, the user cannot provide the three highest peaks for each walking test cycle.
 - This annex also introduces the need to perform statistical analysis of the footwear/flooring to understand whether operators can safely handle a defined human body model sensitive part. It is crucial to apply statistical analysis to the walking voltages of multiple people (5-10 subjects, each wearing the same type of footwear). The test subjects should represent a cross-section of the operators that will be wearing the footwear (men, women, large, and small).
- WG reviewed the new Annex A.4 - Voltage Measurement Apparatus Verification

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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 discussed suggestions for editorial and technical changes in boilerplates for
 - Specimen support surface:
 - Agreed on a new definition of minimum size.
 - Consensus that the specimen support surface shall be measured right before the measurement starts in the defined environmental condition and that the specimen support surface should be conditioned together with the specimen (recommendation!).
 - Added a note to the Working Group/Working Group Chairs that for a minimum resistance of the specimen support surface of 1.0×10^{12} ohms, the explanatory note is not required.
 - Hand-held electrode: Added the option to connect the electrode using a multi-pin connector to support the currently available hand-held electrode for certain walking test equipment.
 - Reporting of conditioning parameters: Controversial discussion, will be continued after review of boilerplate for “environmental condition”.

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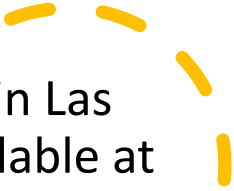
Manufacturing Task Team

- Manufacturing TT discussed suggestions for editorial and technical changes in Annex A (“Set-up Verification”):
 - Approved minor editorial changes
 - Changed resistor values for verification of the resistance measurement apparatus to 20% above the minimum required measurement range of the meter and 20% below the maximum required measurement range of the meter.
 - Changed the procedure for the determination of the lower and upper limit of the measurement range of the entire set-up: Added a cleaning procedure before the measurement.

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Our next meeting series is on June 1-5, in Las Vegas, NV. The meeting schedule is available at www.esda.org under Events.