

ANSI/ESD SP3.5-2020

ESD Association Standard Practice

ANSI/ESD SP3.5-2020



*For the Protection of Electrostatic
Discharge Susceptible Items*

*Test Methods for Air Assist Bar
Ionizer, Soft X-Ray (Photon) Ionizers,
Alternative Room Ionization, and
Non-Airflow Alpha Ionizers*

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7900 Turin Road, Bldg. 3
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*An American National Standard
Approved December 7, 2020*

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for the Protection of Electrostatic Discharge
Susceptible Items***

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Ionizer, Soft X-Ray (Photon) Ionizers,
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Non-Airflow Alpha Ionizers***

Approved September 1, 2020
EOS/ESD Association, Inc.



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Published by:

Electrostatic Discharge Association
7900 Turin Road, Bldg. 3
Rome, NY 13440

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Printed in the United States of America
ISBN: 1-58537-320-6

(This foreword is not part of ESD Association Standard Practice ANSI/ESD SP3.5-2020)

FOREWORD

Grounding (of conductive and static dissipative materials, personnel, and equipment) is the primary method used to limit static charge to protect electrostatic discharge susceptible items in the work environment. A static control program may include air or nitrogen ionization techniques to mitigate charge on isolated conductors (conductors that are not grounded) and insulating materials (for example, most common plastics) that cannot be grounded.

The ionization standard test method, ANSI/ESD STM3.1, defines test methods and instrumentation, including the charged plate monitor (CPM) for making discharge (charge neutralization) time and offset voltage (ion balance) measurements of air ionization equipment in defined environments. This standard test method is applicable for product qualification, selecting an air ionizer for a specific application, and subsequently determining that the incoming product meets the selection criteria.

The test instrumentation and methods of ANSI/ESD STM3.1 or ANSI/ESD SP3.3 are usable for compliance verification of ionizer performance per ESD TR53. ANSI/ESD STM3.1 also contains additional information regarding ionizer physics, ionizer measurement issues, and sources of measurement error. The user is advised to review ANSI/ESD STM3.1 and ANSI/ESD SP3.3, including the annexes, before using the procedures described in this standard practice¹.

There is a lack of measurement methods for new ionizer designs, which are not covered by the ionization test methods in ANSI/ESD STM3.1 and ANSI/ESD SP3.3. This standard practice presents test procedures for ionizers that are not addressed in ANSI/ESD STM3.1, such as air-assist bar ionizers, soft x-ray ionizers, a method of alternative room ionization, and non-airflow alpha ionizers. New test positions and measurement distances are provided. The test procedures describe test conditions such as compressed gas pressures, air volume, interlock systems, and laminar flow. Discharge time and offset voltage testing in the ionization standard test method are adopted for this standard practice. Test points and distances from ionizers are similar to ANSI/ESD STM3.1 and use the same measurement equipment, the CPM.

It is important that the same type of test procedures, based on ANSI/ESD STM3.1, apply to these additional types of ionizers.

This standard practice aims to provide proper test procedures for ionizers, excluding those already described in ANSI/ESD STM3.1. The ionizer technologies discussed in this document are air assisted bar, x-ray, alternative room, and alpha ionizers. The test setups proposed are not meant to be a recommendation for any ionizer configuration. The wide variety of ionizers and the environments the ionizers are used in will often require test setups different from those described in this standard practice. For qualification, ionizers must be tested in the same environmental conditions, such as laminar airflow space, compressed gas supply, or shielded area. Users of this standard practice should be prepared to adapt the test procedure and setups as required to produce meaningful data in the application of ionizers. At any time in the future, using the same procedures in this standard practice, the user can verify whether the ionizer provides a comparable level of performance. The user will need to decide the extent of the data required for each application.

This document was designated ANSI/ESD SP3.5-2020 and approved on September 1, 2020.

¹ **Standard Practice (SP):** A procedure for performing one or more operations for functions that may or may not yield a test result. Note, if a test result is obtained it is not reproducible.

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