

ANSI/ESD SP3.3-2016

ESD Association Standard Practice

ANSI/ESD SP3.3-2016
Reaffirmation of ANSI/ESD SP3.3-2012

*For the Protection of Electrostatic
Discharge Susceptible Items -*

*Periodic Verification of
Air Ionizers*



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*ESD Association Standard Practice for the
Protection of Electrostatic Discharge
Susceptible Items -*

*Periodic Verification of
Air Ionizers*

Approved September 23, 2016
EOS/ESD Association, Inc.



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FOREWORD

Grounding of conductive and static dissipative materials, personnel, and equipment is the primary method used to limit static charge for the protection of 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 (e.g., most common plastics).

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

The test instrumentation and methods of the standard test method are also 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 before using the procedures described in this standard practice¹.

Detailed performance testing under laboratory conditions may be required during selection, product qualification, and acceptance testing due to the variety of environments in which ionizers are used. Periodic and compliance verification, however, are most often performed under actual use conditions. In general, all ionizers must be tested, rather than a sampling of product types or incoming lots.

Periodic verification procedures should also be part of the initial acceptance process to provide a baseline for comparison with future measurements. Compliance verification may be necessary to meet audit requirements.

ANSI/ESD STM3.1 is sufficient to be used for product qualification, selection or acceptance testing, as well as for compliance verification. However, these procedures require a typically expensive test instrument and a substantial amount of time to test each ionizer. The cost of this testing is often unacceptable for purposes of periodic verification.

There is a need for a simpler verification procedure using less expensive, preferably portable, test equipment. Periodic verification provides a relative measure of performance and can indicate when it is necessary to check the calibration of the ionizer under test with the CPM (refer to ANSI/ESD STM3.1).

This standard practice presents a test procedure and instrumentation for periodic verification of ionizers contained in the existing ionization standard test method ANSI/ESD STM3.1. The test procedure can be carried out under actual use conditions and is capable of rapidly demonstrating ionizer performance. Discharge times and offset voltage testing contained in the ionization standard test method were adapted for this periodic test procedure. It is important that a simplified verification procedure correlate reasonably with CPM test results.

The objective of the test procedure described in this document is to identify if a significant change in ionizer performance has occurred. The test setups proposed are not meant to be a recommendation for any particular ionizer configuration. The wide variety of ionizers, and the environments within which they are used, will often require test setups different from those described in this standard practice. For purposes of periodic verification, it is important that ionizers are tested in their normal operating configuration. Users of this standard practice should

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

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be prepared to adapt the test procedure and setups as required to produce meaningful data in their own application of ionizers.

Similarly, the test procedure and conditions chosen in this standard practice do not represent a recommendation for acceptable ionizer performance. There is a wide range of item sensitivities to static charge. There is also a wide range of environmental conditions affecting the operation of ionizers. Performance specifications should be an agreement between the user and manufacturer of the ionizer in each application. Compliance with these specifications should be demonstrated during product qualification or selection and acceptance testing of the ionizers.

Users of this standard practice will be able to establish baseline performance in the actual use location for their own application of ionizers. At any time in the future, using the same procedures in this standard practice, the user will be able to verify whether or not the ionizer is providing a comparable level of performance. The user will need to decide the extent of the data required for each application.

This standard practice was originally designated ESD SP3.3-2000 and approved on February 6, 2000. ANSI/ESD SP3.3-2006 was a reaffirmation, re-designation of ESD SP3.3-2000 and approved on June 11, 2006. ANSI/ESD SP3.3-2016 is a reaffirmation of ANSI/ESD SP3.3-2012 and was approved on September 23, 2016.

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ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items – Periodic Verification of Air Ionizers

1.0 PURPOSE AND SCOPE

1.1 Purpose

This standard practice provides test procedures for periodic verification of the performance of air ionization equipment and systems (ionizers).

1.2 Scope

This standard practice establishes measurement procedures, under recommended conditions, to periodically determine offset voltage (ion balance) and discharge (charge neutralization) times for ionizers in their actual use locations. This standard practice does not include measurements of electromagnetic interference (EMI), or uses of ionizers in connection with ordnance, flammables, explosive items, or electrically initiated explosive devices.

2.0 REFERENCED PUBLICATIONS

Unless otherwise specified, the following documents of the latest issue, revision or amendment form a part of this standard to the extent specified herein:

ESD ADV 1.0, ESD Association's Glossary of Terms²

ANSI/ESD STM3.1, Ionization²

3.0 DEFINITIONS

The terms used in the body of this document are in accordance with the definitions found in ESD ADV1.0, ESD Association's Glossary of Terms available for complimentary download at www.esda.org.

4.0 PERSONNEL SAFETY

THE PROCEDURES AND EQUIPMENT DESCRIBED IN THIS DOCUMENT MAY EXPOSE PERSONNEL TO HAZARDOUS ELECTRICAL CONDITIONS. USERS OF THIS DOCUMENT ARE RESPONSIBLE FOR SELECTING EQUIPMENT THAT COMPLIES WITH APPLICABLE LAWS, REGULATORY CODES, AND BOTH EXTERNAL AND INTERNAL POLICY. USERS ARE CAUTIONED THAT THIS DOCUMENT CANNOT REPLACE OR SUPERSEDE ANY REQUIREMENTS FOR PERSONNEL SAFETY.

GROUND FAULT CIRCUIT INTERRUPTERS (GFCI) AND OTHER SAFETY PROTECTION SHOULD BE CONSIDERED WHEREVER PERSONNEL MIGHT COME INTO CONTACT WITH ELECTRICAL SOURCES.

ELECTRICAL HAZARD REDUCTION PRACTICES SHOULD BE EXERCISED AND PROPER GROUNDING INSTRUCTIONS FOR EQUIPMENT SHOULD BE FOLLOWED.

THE RESISTANCE MEASUREMENTS OBTAINED THROUGH THE USE OF THIS TEST METHOD SHALL NOT BE USED TO DETERMINE THE RELATIVE SAFETY OF PERSONNEL EXPOSED TO HIGH AC OR DC VOLTAGES.

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