

ANSI/ESD S6.1-2019

ESD Association Standard

ANSI/ESD S6.1-2019
Revision of ANSI/ESD S6.1-2014



*For the Protection of Electrostatic
Discharge Susceptible Items*

Grounding

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

*An American National Standard
Approved October 28, 2019*

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

Approved June 19, 2019
EOS/ESD Association, Inc.



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FOREWORD

The single most important concept in the field of static control is grounding. Attaching all electrically conductive and dissipative items in the workplace to ground allows built-up electrostatic charges to equalize with ground potential. A grounded conductor (includes dissipative items) cannot hold a static charge.

Electrically interconnecting all electrically conductive and dissipative items (bonding) allows charge to equalize across these items without actual contact to ground. This provides static control in areas where an actual connection to ground may not be accessible, such as in a field service environment. Electrically bonded conductors and dissipative items share stored electrical charge and therefore have no difference in electrical potential between them. Many types of Electrostatic Discharge (ESD) susceptible parts can be handled within a bonded system without causing damage.

Grounding of conductors for static control purposes may not provide sufficient grounding for Electromagnetic Interference (EMI) reduction or control. Low impedance electrical connections are required for EMI grounding and bonding, while static grounding can be accomplished with relatively high resistance in connection points as well as along the discharge path.

Users of this document need to consider the National Electric Code or other applicable laws and electrical system designs and specifications in the country where an ESD control program plan is being implemented.

This standard¹ was originally approved on September 24, 1991, and was designated EOS/ESD-S6.1-1991. ANSI/ESD S6.1-1999 was a reaffirmation, re-designation of EOS/ESD-S6.1-1991, and approved on May 16, 1999. ANSI/ESD S6.1-2005 was a reaffirmation of ANSI/ESD S6.1-1999 and approved on June 12, 2005. ANSI/ESD S6.1-2009 was a reaffirmation of ANSI/ESD S6.1-2005 and was approved on May 18, 2009. ANSI/ESD S6.1-2014 was a revision of ANSI/ESD S6.1-2009 and was approved on September 24, 2013. ANSI/ESD S6.1-2019 is a revision of ANSI/ESD S6.1-2014 and was approved on June 19, 2019.

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¹ **ESD Association Standard (S):** A precise statement of a set of requirements to be satisfied by a material, product, system or process that also specifies the procedures for determining whether each of the requirements is satisfied.

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TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE	1
1.1 PURPOSE	1
1.2 SCOPE	1
2.0 REFERENCED DOCUMENTS	1
3.0 DEFINITION OF TERMS	1
4.0 PERSONNEL SAFETY	2
5.0 TECHNICAL REQUIREMENTS	2
5.1 ESD GROUNDING/BONDING REFERENCE SYSTEMS.....	2
5.1.1 AC Equipment Ground	2
5.1.2 Auxiliary Ground.....	2
5.1.3 Equipotential Bonding	3
5.2 CONNECTIONS TO THE ESD GROUNDING/BONDING REFERENCE POINT	3
5.2.1 Common Point Ground	3
5.2.2 Auxiliary Ground System	5
5.2.3 Equipotential Bonding	5
5.3 OTHER CONSIDERATIONS.....	6
5.3.1 Metal Bench Tops	6
5.3.2 Isolated Ground Receptacles.....	6
5.3.3 ESD Technical Element Conductors.....	6
5.3.4 Vehicles.....	7
5.3.5 Mechanical Requirements	7
6.0 ELECTRICAL REQUIREMENTS	7
6.1 INSTRUMENTATION.....	7
6.1.1 DC Ohmmeter	7
6.1.2 AC Circuit Tester (Impedance Meter)	7
6.2 ESD GROUNDING SYSTEM VERIFICATION	7
6.2.1 Equipment Grounding Conductor	7
6.2.2 AC Equipment Ground and Auxiliary Ground Verification	7
6.3 TECHNICAL ELEMENTS	8
6.4 LEVEL 2 TECHNICAL ELEMENTS	10
7.0 TEST PROCEDURES	10
7.1 RECEPTACLE WIRING VERIFICATION	10
7.2 ESD GROUNDING/BONDING REFERENCE POINT TESTS	10
7.2.1 Facilities with AC Equipment Ground	10
7.2.2 Facilities with AC Equipment Ground and Auxiliary Ground	10
7.2.3 Field Service/Equipotential Bonding (Applications without AC Equipment Ground) .	11

ANNEXES

Annex A (Informative): ESD Grounding Considerations 12
Annex B (Informative): ANSI/ESD S6.1 Revision History 13

FIGURES

Figure 1: Common Point Ground Concept (Simple) 3
Figure 1A: Basic EPA Grounding System with Common Point Ground 4
Figure 1B: Common Point Ground (Example Only) 4
Figure 2: Workstation with Two Common Point Grounds to an Auxiliary Ground 5
Figure 3: Typical Field Service Situation using Equipotential Bonding 5
Figure 4: Isolated Ground Receptacle 6
Figure 5: Main Service Equipment, Single Phase 8
Figure 6: Typical ESD Ground Connection and Main Service Equipment 8
Figure 7: Typical ESD Protective Workstation with Common Point Ground 9
Figure 8: Example of a Common Point Ground Resistance Measurement 9

ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Grounding

1.0 PURPOSE AND SCOPE

1.1 Purpose

This standard specifies the parameters, materials, equipment, and test procedures necessary to choose, establish, verify and maintain an Electrostatic Discharge (ESD) Control grounding system for use within an ESD Protected Area (EPA) for protection of ESD susceptible items. This standard also specifies the criteria for establishing ESD bonding for the protection of ESD susceptible items in field service or other remote operations.

1.2 Scope

This standard applies to bonding and grounding for the prevention of ESD in an EPA. The procedures, materials, and techniques specified in this standard may not be applicable for grounding of electrical sources operating at frequencies above 400 Hz. Electrically initiated explosive devices and hazardous areas with flammable atmospheres may require additional considerations that may not be adequately covered by these requirements.

2.0 REFERENCED DOCUMENTS

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 – Glossary of Terms²

ANSI/NFPA 70 – National Electric Code³

3.0 DEFINITION OF TERMS

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.

AC equipment ground. a.) The ground point at which the equipment grounding conductor is bonded to any piece of equipment at the equipment end of the conductor in a single-phase 120 VAC electrical service. b.) The 3rd wire (green/green with a yellow stripe) terminal of a receptacle. NOTE: Wiring colors may vary in national electric codes. c.) The entire low impedance path (electrically equivalent to the equipment grounding conductor) from a piece of electrical equipment to the neutral bus at the main service equipment).

ESD grounding/bonding reference system. The ESD grounding system selected for use in a facility or situation that best suits the application: a) AC equipment ground; b) auxiliary ground; c) equipotential bonding.

ESD grounding/bonding reference point. The physical location where the common point ground is connected to the selected ESD grounding/bonding reference system.

ESD technical elements. All of the items, materials, devices, tools, and equipment used within an EPA for the control of static electricity.

level 2 technical elements. Any ESD technical element that is connected in series to common point ground or to a common connection point (equipotential bonding) through another technical element.

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³ National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471