

ANSI/ESD STM11.11-2022

# ESD Association Standard Test Method

ANSI/ESD STM11.11-2022

Limited Revision of ANSI/ESD STM11.11-2021



*for the Protection of Electrostatic  
Discharge Susceptible Items*

*Surface Resistance Measurement of  
Planar Materials*

*Electrostatic Discharge Association  
218 West Court Street  
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*ESD Association Standard Test Method  
for the Protection of Electrostatic Discharge  
Susceptible Items*

*Surface Resistance Measurement of  
Planar Materials*

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(This foreword is not part of ESD Association Standard Test Method ANSI/ESD STM11.11-2022)

## FOREWORD

This standard test method<sup>1</sup> was developed to fulfill a need to measure planar materials not provided for by existing ASTM resistivity measurement methods. This procedure is a resistance measurement on the surface of the material and is applied without regard to the sample's mechanism of conduction. In cases where it is valid to convert resistance to resistivity, the resistivity values are a factor of ten higher than the resistance values obtained by this test method.

This standard test method specifies test fixture configuration, environmental conditions, a systems verification procedure, and test voltages. This test method has been proven to be repeatable within one half-order of magnitude through inter-laboratory tests.

This standard test method was originally designated EOS/ESD S11.11-1993 and approved on February 9, 1993. ANSI/ESD STM11.11-2001 was a reaffirmation and redesignation of EOS/ESD S11.11-1993 and was approved on May 20, 2001. ANSI/ESD STM11.11-2006 was a reaffirmation of ANSI/ESD STM11.11-2001 and approved on September 10, 2006. ANSI/ESD STM11.11-2015 is a revision of ANSI/ESD STM11.11-2006 and was approved on May 17, 2013. ANSI/ESD STM11.11-2021 was a revision of ANSI/ESD STM11.11-2015 and was approved on January 26, 2021. ANSI/ESD STM11.11-2022 is a limited revision of ANSI/ESD STM11.11-2021 and was approved on March 2, 2022.

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<sup>1</sup> **ESD Association Standard Test Method (STM):** A definitive procedure for the identification, measurement, and evaluation of one or more qualities, characteristics, or properties of a material, product, system, or process that yield a **reproducible test** result.

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## TABLE OF CONTENTS

<b>1.0 PURPOSE AND SCOPE</b> .....	<b>1</b>
1.1 PURPOSE .....	1
1.2 SCOPE .....	1
<b>2.0 REFERENCED PUBLICATIONS</b> .....	<b>1</b>
<b>3.0 DEFINITIONS</b> .....	<b>1</b>
<b>4.0 PERSONNEL SAFETY</b> .....	<b>1</b>
<b>5.0 GENERAL DISCUSSION</b> .....	<b>2</b>
<b>6.0 TEST EQUIPMENT</b> .....	<b>2</b>
6.1 CONCENTRIC RING ELECTRODE ASSEMBLY.....	2
6.2 SPECIMEN SUPPORT SURFACE.....	3
6.2.1 <i>Specimen Support Surface Dimensions</i> .....	3
6.3 RESISTANCE MEASUREMENT APPARATUS.....	4
6.4 SYSTEM VERIFICATION FIXTURES .....	4
6.4.1 <i>Lower Resistance Range Fixture</i> .....	4
6.4.2 <i>Upper Resistance Range Fixture</i> .....	5
<b>7.0 SAMPLE PREPARATION AND CONDITIONING</b> .....	<b>5</b>
<b>8.0 LOWER RESISTANCE RANGE SYSTEM VERIFICATION PROCEDURE</b> .....	<b>5</b>
<b>9.0 UPPER RESISTANCE RANGE SYSTEM VERIFICATION PROCEDURE AND     DETERMINATION OF ELECTRIFICATION PERIOD</b> .....	<b>6</b>
<b>10.0 TESTING SPECIMENS</b> .....	<b>6</b>
<b>11.0 REPORTING THE SURFACE RESISTANCE DATA</b> .....	<b>7</b>
<b>12.0 CONVERSION TO RESISTIVITY</b> .....	<b>7</b>
 <b>ANNEXES</b>	
Annex A (Informative): Use of 2.27 kg Resistance Measurement Electrodes .....	8
Annex B (Informative): Revision History for ANSI/ESD STM11.11 .....	9

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**FIGURES**

Figure 1: Concentric Ring Electrode Assembly ..... 3  
Figure 2: Lower Resistance Range Verification Fixture ..... 4  
Figure 3: Upper Resistance Range Verification Fixture ..... 5  
Figure 4: Test Set-up ..... 7

**ESD Association Standard Test Method for Protection of Electrostatic Discharge Susceptible Items – Surface Resistance Measurement of Planar Materials**

**1.0 PURPOSE AND SCOPE**

**1.1 Purpose**

This standard test method defines the test procedure, equipment, sample preparation, and conditioning needed to achieve reproducible surface resistance measurements.

**1.2 Scope**

This standard test method defines a direct current measurement to determine the surface resistance of planar materials, without regard to the conduction mechanism. This procedure is intended for measuring the surface resistance of materials that are  $\geq 1.0 \times 10^4$  ohms and  $< 1.0 \times 10^{11}$  ohms.

NOTE: This test method has been shown to have a repeatability of approximately one-half order of magnitude through inter-laboratory tests.

**2.0 REFERENCED PUBLICATIONS**

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

ESD ADV1.0, Glossary<sup>2</sup>

ASTM D257, Standard Test Method for DC Resistance or Conductance of Insulating Materials<sup>3</sup>

ASTM D991, Standard Test Method for Rubber Property – Volume Resistivity of Electrically Conductive and Antistatic Products<sup>3</sup>

**3.0 DEFINITIONS**

The terms used in the body of this document are in accordance with the definitions found in ESD ADV1.0, Glossary available for complimentary download at [www.esda.org](http://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.**

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