
TABLE OF CONTENTS

1.0 PURPOSE	1
2.0 SCOPE	1
3.0 PERSONNEL SAFETY	1
4.0 TEST EQUIPMENT	2
4.1 AC OUTLET ANALYZER	2
4.2 AC CIRCUIT TESTER (IMPEDANCE METER).....	2
4.3 CHARGED PLATE MONITOR (CPM)	2
4.4 CONCENTRIC RING ELECTRODE ASSEMBLY.....	2
4.5 DC OHMMETER	2
4.6 ELECTROSTATIC FIELD METER	2
4.7 ELECTROSTATIC VOLTAGE METER.....	3
4.8 FOOT ELECTRODE	3
4.9 HAND-Held ELECTRODE.....	3
4.10 INSULATIVE SUPPORT SURFACE	3
4.11 INTEGRATED CHECKER	3
4.12 RESISTANCE MEASUREMENT APPARATUS.....	3
4.13 RESISTANCE MEASUREMENT ELECTRODE(S)	3
4.14 TWO-POINT PROBE	3
5.0 GROUNDING / BONDING SYSTEMS.....	4
5.1 OBJECTIVE	4
5.2 TEST EQUIPMENT	4
5.3 TEST PROCEDURE	5
5.3.1 <i>Electrical Receptacles</i>	5
5.3.2 <i>Personnel Groundable Points</i>	5
5.4 TROUBLESHOOTING	5
5.4.1 <i>Electrical Receptacle Failures</i>	5
5.4.2 <i>Personnel Groundable Point Failures</i>	5
6.0 WORKSURFACES	6
6.1 OBJECTIVE	6
6.2 TEST EQUIPMENT	6
6.3 TEST PROCEDURE	6
6.4 TROUBLESHOOTING	7
6.4.1 <i>Visual / Mechanical Check</i>	7
6.4.2 <i>Electrical Test</i>	7
7.0 WRIST STRAPS	8
7.1 OBJECTIVE	8
7.2 TEST EQUIPMENT	8
7.3 TEST PROCEDURE	8

7.3.1 <i>Integrated Checker</i>	8
7.3.2 <i>Meter</i>	9
7.4 TROUBLESHOOTING	9
8.0 FOOTWEAR.....	10
8.1 OBJECTIVE	10
8.2 TEST EQUIPMENT	10
8.3 TEST PROCEDURE	10
8.3.1 <i>Integrated Checker</i>	10
8.3.2 <i>Meter</i>	10
8.4 TROUBLESHOOTING	11
9.0 FLOORING.....	12
9.1 OBJECTIVE	12
9.2 TEST EQUIPMENT	12
9.3 TEST PROCEDURE	12
9.4 TROUBLESHOOTING	13
10.0 SEATING.....	13
10.1 OBJECTIVE	13
10.2 TEST EQUIPMENT	13
10.3 TEST PROCEDURE	14
10.4 TROUBLESHOOTING	15
11.0 AIR IONIZERS	15
11.1 OBJECTIVE	15
11.2 TEST EQUIPMENT	15
11.3 TEST PROCEDURE	15
11.3.1 <i>Initial Test Setup</i>	15
11.3.2 <i>Discharge Time Test</i>	15
11.3.3 <i>Offset Voltage Test (Balance)</i>	16
11.4 TROUBLESHOOTING	16
12.0 MOBILE EQUIPMENT	17
12.1 OBJECTIVE	17
12.2 TEST EQUIPMENT	17
12.3 TEST PROCEDURE	17
12.4 TROUBLESHOOTING	18
13.0 ELECTRICAL SOLDERING / DESOLDERING HAND TOOLS.....	19
13.1 OBJECTIVE	19
13.2 TEST EQUIPMENT	19
13.3 TEST PROCEDURE	19
13.3.1 <i>Soldering Iron Tip Voltage Test Procedure</i>	19
13.3.2 <i>Soldering / Desoldering Hand Tools Resistance to Ground</i>	20
13.3.3 <i>Soldering / Desoldering Hand Tools Resistance to Ground-Cold Iron</i>	20

13.4 TROUBLESHOOTING	20
14.0 CONSTANT (CONTINUOUS) MONITORS	20
14.1 OBJECTIVE	20
14.2 TEST EQUIPMENT	21
14.3 TEST PROCEDURE	21
14.4 TROUBLESHOOTING	21
15.0 GROUNDABLE STATIC CONTROL GARMENT SYSTEM	21
15.1 OBJECTIVE	21
15.2 TEST EQUIPMENT	21
15.3 TEST PROCEDURE	22
15.3.1 <i>Integrated Checker</i>	22
15.3.2 <i>Meter</i>	22
15.4 TROUBLESHOOTING	23
16.0 STATIC CONTROL GARMENTS AND GROUNDABLE STATIC CONTROL GARMENTS POINT-TO-POINT METHOD.....	24
16.1 OBJECTIVE	24
16.2 TEST EQUIPMENT	24
16.3 TEST PROCEDURE	24
16.4 TROUBLESHOOTING	25
17.0 STATIC CONTROL GARMENTS AND GROUNDABLE STATIC CONTROL GARMENTS HANGING CLAMP METHOD	25
17.1 OBJECTIVE	25
17.2 TEST EQUIPMENT	25
17.3 TEST PROCEDURE	25
17.4 TROUBLESHOOTING	27
18.0 PACKAGING.....	27
18.1 OBJECTIVE	27
18.2 TEST EQUIPMENT	27
18.3 TEST PROCEDURE	27
18.3.1 <i>Surface Resistance Using an Integrated Checker or Meter</i>	27
18.3.2 <i>Surface Resistance Using a Concentric Ring</i>	28
18.3.3 <i>Surface Resistance Using a Meter and Two-Point Probe</i>	28
18.3.4 <i>Point to Point Using a Resistance Measurement Electrode(s)</i>	29
18.3.5 <i>Volume Resistance Using an Integrated Checker or Meter</i>	29
18.4 TROUBLESHOOTING (SURFACE AND VOLUME RESISTANCE)	30
19.0 GLOVES AND FINGER COTS – IN-USE RESISTANCE	30
19.1 OBJECTIVE	30
19.2 TEST EQUIPMENT	31
19.3 TEST PROCEDURE	31

19.3.1 <i>Integrated Checker</i>	31
19.3.2 <i>Constant Area and Force Electrode (CAFE)</i>	32
19.4 TROUBLESHOOTING	32
20.0 PROCESS REQUIRED INSULATORS	33
20.1 OBJECTIVE	33
20.2 TEST EQUIPMENT	33
20.3 TEST PROCEDURE MEASURING FIELD STRENGTH ON PROCESS REQUIRED INSULATORS.....	33
20.4 TROUBLESHOOTING	34

ANNEXES

Annex A (Informative) - Test Frequency	35
Annex B (Informative) - ESD TR53-01-15 Revision History.....	36

FIGURES

Figure 1: ESD Protective Workstation	4
Figure 2: ESD Worksurface Test	6
Figure 3: Wrist Strap Test Using Integrated Checker.....	8
Figure 4: Wrist Strap Test Using Meter	9
Figure 5: ESD Footwear Test Using Meter.....	11
Figure 6: ESD Flooring Test	12
Figure 7: ESD Chair Test.....	14
Figure 8: ESD Mobile Equipment Test	18
Figure 9: Resistance Measurement Pictorial.....	19
Figure 10: Groundable Static Control Garment System - Using Integrated Checker.....	22
Figure 11: Test Setup – Groundable Garment in Combination with a Person-Hand-Held Probe and Meter	23
Figure 12: Garment (Point-to-Point) Test	24
Figure 13: Electrodes for Hanging Garment Test	26
Figure 14: Alternate Point-To-Point Resistance Measurement	26
Figure 15: Set-up for Test Method using a Concentric Ring Electrode	28
Figure 16: Set-up for Test Method using a Meter and Two-Point Probe	29
Figure 17: Set-up for Test Method using Two Five-Pound Weights.....	29
Figure 18: Set-up for Test Method using a Concentric Ring Electrode	30
Figure 19: Wrist Strap Test Wearing a Glove Using Integrated Checker	31
Figure 20: Test Wearing a Glove Using Constant Area and Force Electrode.....	32