

ICS 17.220.20

CCS L 06



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 37977.21-2023

**Electrostatics - Part 2-1: Measurement methods - Ability of
materials and products to dissipate static electric charge**

Issued on: August 6, 2023

Implemented on: December 1, 2023

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	1
2 Normative reference documents	1
3 Terms and Definitions	1
4 Measurement method of charge dissipation	2
4.1 Principle	2
4.2 Environmental conditions	2
4.3 Corona charge attenuation measuring instrument	3
4.3.1 Physical structure	3
4.3.2 Test material requirements	4
4.3.3 Corona charge deposition	4
4.3.4 Electrostatic voltmeter	4
4.4 Charging board monitor	5
4.4.1 Physical structure	5
4.4.2 Charge decay time (tsd)	6

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 2-1 of GB/T 37977 "Electrostatics". GB/T 37977 has released the following parts.

---Part 2-1. Test methods Materials and products electrostatic charge dissipation ability;

---Part 2-3. Test methods for resistance and resistivity of antistatic solid planar materials;

---Part 3-2. Simulation method of electrostatic effects and electrostatic discharge test waveform of machine model (MM);

---Part 4-8. Standard test methods for electrostatic discharge shielding bags in specific applications;

---Part 5-1. General requirements for electrostatic protection of electronic devices.

This document is equivalent to IEC 61340-2-1:2015 "Electrostatics Part 2-1. Test methods for electrostatic charge dissipation capabilities of materials and products".

This document has made the following minimal editorial changes.

---Incorporated the amendments to IEC 61340-2-1:2015/AMD1:2022, the outer margins of the clauses involved are

Vertical double lines (||) are marked.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

The GB/T 37977 series of standards are basic standards for electrostatics. They all adopt the IEC 61340 series of international standards to define electrostatic effects.

Simulation methods, anti-static parameter testing methods for anti-static materials and products, standard test methods in specific applications, electrostatic protection of electronic devices

Protect etc. The GB/T 37977 series of standards is planned to consist of 11 parts, consistent with the structure of the IEC 61340 series of standards.

---Part 2-1. Test methods for electrostatic charge dissipation capabilities of materials and products. The purpose is to specify test methods for testing insulation

and the static charge dissipation capabilities of static dissipative materials and products.

---Part 2-3. Test methods for resistance and resistivity of antistatic solid planar materials. The purpose is to specify test methods for measuring

Test the resistance and resistivity of the anti-static solid planar material. The applicable range of the measured resistance is 10⁴ohm~10¹²ohm.

---Part 3-1. Simulation method of electrostatic effects and electrostatic discharge test waveform of human body model (HBM). The purpose is to specify

Basic requirements for electrostatic discharge current waveforms used to simulate HBM and the equipment used to generate and verify these waveforms.

---Part 3-2. Simulation method of electrostatic effects and electrostatic discharge test waveform of machine model (MM). The purpose is to specify

Basic requirements for simulating electrostatic discharge current waveforms of MM and the equipment used to generate and verify these waveforms.

---Part 4-1. Standard test methods Resistance of floor coverings and assembled floors in specific applications. The purpose is to specify the test

This test method is used to test the resistance of floor coverings and assembled floors, including ground resistance, point-to-point resistance and vertical resistance. It is

The applicable range of resistance measurement is 104ohm~1013ohm.

---Part 4-3. Standard test methods for footwear in specific applications. The purpose is to specify test methods for testing anti-static shoes

The resistance.

---Part 4-5. Standard test methods for characterization of electrostatic protection characteristics of human/shoe/ground systems in specific applications. The purpose is

It is a prescribed test method for evaluating the anti-static performance of the person/shoe/ground system.

---Part 4-6. Standard test methods for wristbands in specific applications. The purpose is to clarify the electrical and mechanical performance requirements of the wristband.

requirements, and experimental methods for testing these properties.

---Part 4-8. Standard test methods for electrostatic discharge shielding bags in specific applications. The purpose is to provide evaluation of electrostatic discharge screens

Test method for bag performance.

---Part 4-9. Standard test methods for clothing in specific applications. The purpose is to specify test methods for testing anti-static clothing

installed resistor.

---Part 5-1. General requirements for electrostatic protection of electronic devices. The purpose is to establish anti-static management and technical requirements to avoid or

Reduce damage to electronic products due to electrostatic discharge.

The conductive properties of a homogeneous conductive material can be evaluated indirectly by measuring its resistance or resistivity. Note when determining the homogeneity of the material

Meaning. Some seemingly homogeneous materials exhibit non-homogeneous electrical properties; for materials whose homogeneity is uncertain and cannot be verified by other methods

material, the measured resistance may be inaccurate or one-sided. When evaluating dissipative or insulating materials, especially for high-resistance materials, including conductive fibers

Fabrics (such as fabrics with metal mesh), resistance measurements may also be inaccurate. In these cases, it is appropriate to directly measure the electrostatic charge

dissipation of the material.

Dispersion ability.

Electrostatics Part 2-1. Test Methods

Materials and products static charge dissipation capabilities

1 Scope

This document describes test methods for measuring the electrostatic charge dissipation capability of insulating and static dissipative materials and products.

This document contains an overview of test methods and detailed test procedures for specific supplies.

There are two test methods for measuring charge decay time, one is the corona charging method, and the other is the charged metal plate method. Although these two are not

Different test methods may obtain different measurement results, but they have their own most suitable application ranges. Corona charging method is suitable for evaluating materials

The ability of materials (e.g. textiles, packaging, etc.) to dissipate charge from their own surfaces; the charged metal plate method is suitable for evaluating materials and items (e.g..

The ability of gloves, finger cots, hand tools, etc.) to dissipate an electrical charge by being placed on or in contact with an electrical conductor. The live metal plate method may not be suitable

Used to evaluate the ability of a material to dissipate charge from its own surface.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

IEC 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use Part 1. General requirements (Safety requirements)

Note. GB 4793.1-2007 Safety requirements for electrical equipment for measurement,