

**ESD TR7.0-01-11**

# **ESD Association Technical Report**

**ESD TR7.0-01-11**

***For the Protection of Electrostatic  
Discharge Susceptible Items***

***Static Protective Floor Materials***

***Author:***  
**Working Group 7.0,**  
**Flooring**  
**ESD Association**



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**FOREWORD**

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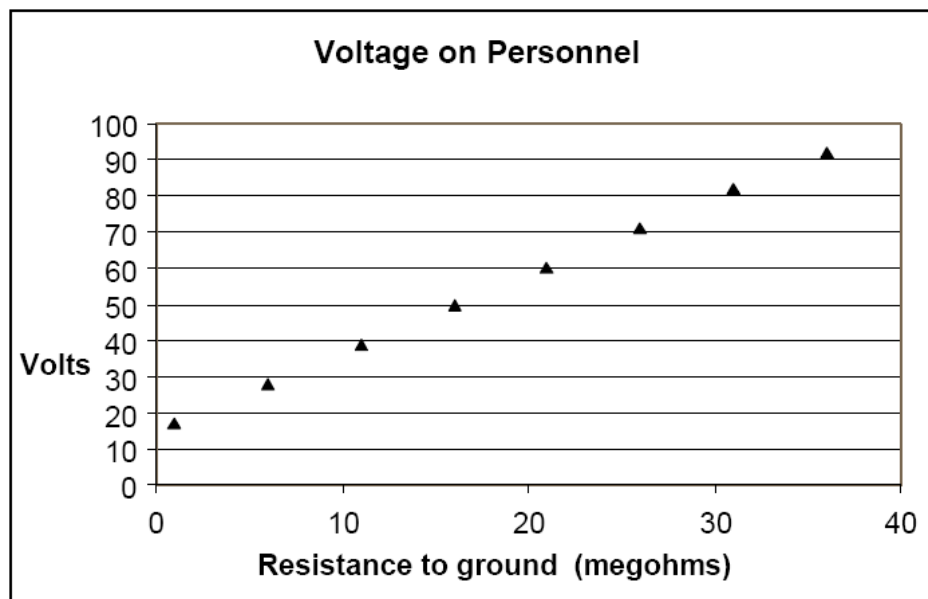
## ESD Association Technical Report for the Protection of Electrostatic Discharge Susceptible Items – Static Protective Floor Materials

### 1.0 INTRODUCTION

Movement of people and materials in the work environment is frequently cited as a major source of static electricity. This routine movement, particularly the contact and separation of shoes with the floor, generates voltages on personnel as high as several thousand volts. Similarly, the movement of carts or other equipment will generate electrostatic charge. This technical report will review the use of floor materials to dissipate electrostatic charge. It provides an overview on floor coverings, floor finishes, topical antistats, floor mats, paints and coatings. It also covers a variety of other issues related to floor material selection, installation and maintenance.

### 1.1 Functions of Static Protective Floor Materials

Traditionally, wrist strap systems have been used to control static electricity on personnel. However, various types of floor materials are used as alternatives or supplements to the wrist strap systems. A floor provides a method of connecting a person to ground while they are standing and walking, as well as carts or other mobile equipment. Using a footwear/flooring system is one way to control voltage on people. The system is used to provide an adequate resistance to ground to assure voltage levels stay below the damage threshold for devices. This resistance can be measured using ANSI/ESD STM97.1. Alternatively, voltage generation on a person can be evaluated using ANSI/ESD STM97.2. See Figure 1 for an example of footwear/flooring system resistance versus body voltage generation.



*Figure 1: Footwear/Flooring System Resistance vs. Body Voltage Generation*

Floor coverings, mats, paints, and coatings help control static charge by providing a path of moderate electrical conductivity from the human body (or equipment) to ground. Generally there is a conductive material—such as carbon, metal, or other additives—that electrically connects the surface of the floor material to an underlying substrate such as conductive adhesive. The floor material and in some cases the underlying conductive substrate is then connected to ground.