

Workplace Safety

# ESD vs. Switchboard Matting: Life or Death

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## Why is knowing the difference between switchboard and ESD matting so important?

There's an all-too-common misconception that all mats designed to reduce some kind of shock are the same. Both ESD (conductive matting) and switchboard matting (non-conductive matting) reduce shock, but they're on completely opposite sides of the spectrum. It's critical that purchasers and users know the difference. This is one matting decision that can literally be the difference between life and death.

## CONDUCTIVE MATTING/ESD

ESD Matting, also known as Static dissipative or conductive matting, is designed to protect sensitive electronic components. Think product quality control. Depending on the level of susceptibility, those components can be ruined with as little as 200 volts. A static shock isn't even felt until it's more than 2,000 volts. That means a costly incident can happen without the user realizing that it's occurred!

Static electricity builds up wherever there is friction between two materials. That friction can be something as basic as walking across the floor. Once static electricity builds up, it seeks out a path to ground. Without ESD or Conductive matting, the static charge rebounds back through the body and uses what the user is handling as ground. That can be an expensive redirection!

Though it may seem confusing based on the terminology, ESD matting reduces the resistance (measure in ohms) of electricity and **encourages** it to pass through and not rebounding back to the product being handled. Any static charge to flow through the user, mat, footwear and carried by a grounding cord well away to a grounding point. It's a long, but fast journey, that in the end, does no damage.

### Analogy

The easiest way to understand the way conductive or ESD matting works is to compare it to a garden hose, with the static charge being the water.

When water passes through an open hose (conductive mat), the water (static) flows easily through without resistance. With ESD matting the hose is slightly bent and resists a slightly less passage. In either case, the water moves relatively unencumbered away from the area and soaked up by the ground far away.

### Choosing the Right ESD Matting

Though "ESD" is a common term, there are in fact 2 types of matting that do the same thing. The product susceptibility determines what matting is used. An electrical charge passing through a conductive matting meets **little** resistance and **drains quickly**. ESD matting has **more** resistance and allows static electricity to drain **slightly slower** than conductive matting.

## NON-CONDUCTIVE/SWITCHBOARD MATTING

Switchboard matting has a singular purpose: to protect personnel from life-threatening electrical shocks. Those shocks can have serious consequences. The statistics are staggering.

Electrocution is **6th** among causes of workplace deaths causing **more than 400 deaths and 4,000 injuries** each year.

Each year in the U.S. 311 deaths are due to electrocution and over 12,000 cases of reported injuries.

When standing on switchboard matting, the user is insulated from the ground, *preventing* an electrical current. Unlike ESD matting, the purpose of a non-conductive mat is to resist electrical charges, acting as a protective barrier to prevent dangerous shock up to 30,000 volts.

Switchboard matting provides an insulating barrier between the worker and the ground. The non-conductive properties of the mat work by stopping the electric charge from passing through a user in search of a ground that doesn't exist. When there isn't ground, electricity will continue to flow until contact is broken at the source. Depending on the voltage and exposure, the result can range from severe burns to death.

### Analogy

Again, we'll use the analogy of water and a hose. When water (electricity) passes through a hose and that hose is folded in half (switchboard matting) the water (electricity) meets resistance, and the flow stops.

## CHOOSING THE RIGHT SWITCHBOARD MATTING

In high-voltage situations, make sure to choose the matting with the proper standard and voltage rating.

Even among switchboard matting there are different industry standards, styles, and levels of protection.

### Industry Standard: ANSI/ASTM D178-01

Type I: made using any properly vulcanized elastomer

Type II: made using any properly vulcanized elastomer AND has additional properties such as Ozone Resistance, Flame Resistance, and Oil Resistance

Class 2 and 3 define the dielectric strength: the higher the class, the greater the dielectric strength.

### Navy/Defense Dept. Standard: MIL. SPEC. 15562-G

Type I: Sheet, smooth surface

Type II: Mat, runner type, smooth surface

Type III: Mat, runner type, raised diamond-pattern surface

It's important to purchase *switchboard matting* from a reputable company. **Wearwell** is the leader in the matting industry and offers products that meet both Industry and Military Standards. Every square inch of Wearwell's switchboard matting is tested to ensure users across all industries are protected. With *smooth*, *corrugated*, *marbleized*, and *diamond-plate* surface and color options, you can find insulative matting for virtually any area.

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