

# In Theory – 6

## The Use of Electrostatic Fieldmeters

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Manufacturers save tens of thousands of dollars by investing in one instrument that costs less than six hundred dollars. That instrument is the field-nulling electrostatic fieldmeter.

### What is a fieldmeter?

A fieldmeter is an instrument that senses the strength of an electric field, revealing how charges are distributed over an object. By measuring the charge profile on equipment such as electronic assemblies, handling systems, web processes, and automated packaging machines, a fieldmeter can gauge whether static voltage levels are within acceptable bounds.

There are different types of fieldmeters for a variety of applications.

### Who needs a fieldmeter?

The unseen problem of electrostatic discharge can cause untold damage in numerous industries. Nowhere is this more evident than in the electronics industry, where microchips and computer parts are especially susceptible to damage by electrical charges. Electrostatic fieldmeters help electronic component and semiconductor device manufacturers identify regions of high charge concentration, which may be localized, intermittent or even process dependent. They're also used to measure voltages on carriers that transport wafers, to observe voltages generated in ink-stamping, and to look at voltages induced on chips as they move through a high volume packaging machine or test handler. Other applications that can benefit from the use of fieldmeters include:

#### *Plastics, film & textile manufacturing*

Wherever web, sheet, roll, or filament transport lines are used, static discharge can

occur. When static charges dissipate by arcing (ESD or electrostatic discharge), they can produce defects in a product such as plastic film. They can also discharge to a worker by a painful arc. Photographic films are ruined when light from arcs exposes small areas of film.

Static charges can cause material being processed to stick to itself, jamming production lines, slowing production, causing downtime, and even damaging products and equipment.

#### *Explosive environments*

Wherever flammable vapors or gases exist, arcs can cause fires and even explosions.

#### *Pneumatic conveyance*

When powders, granules, pellets, chips or flakes are conveyed pneumatically, static charges can result as they rub against the conduit carrying them. Jams and blockages occur when static charges cause large numbers of particles to adhere to each other. Fires and explosions inside such pipes are also possible.

#### *Wherever ionization systems are used to control static discharge*

The effectiveness of an ionization system depends on the type of ionizers used and how they are installed. Measuring the static in the area before and after a system is installed helps determine how well the system performs.

It's also important to periodically monitor the area or process to detect unacceptable levels of charge accumulation and verify that the system is working properly.



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