



Static Electricity and Ways to Control It

Ananth Subramanya, Product Manager
February 2023

Summary

As users and converters of pressure sensitive tapes, we must understand static electricity: where it develops, the dangers associated with it, and the ways to control it. Static electricity is much more prevalent in low humidity conditions, specifically during the months of November through March. This guide will explain static electricity and methods for controlling it to inform our customers, protect their employees, and help ensure quality, high performing products.

What is static electricity?

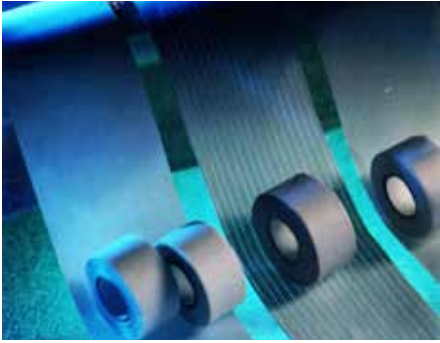
Static electricity builds up when one surface is positively charged and the other surface is negatively charged. Nature's desire for balance causes the charges to attract one another, resulting in the discharge we call static. On a small scale, static discharge can be seen in the form of a spark when you touch a door knob after walking across carpet. On a much larger scale, static electricity can be seen when the electrical potential occurs between clouds and the Earth, creating discharge in the form of a lightning bolt.

What does static have to do with the use of PSA tape?

The act of unwinding and winding a rolled product, such as pressure sensitive tape, inherently creates a buildup of positive and negative charges which can eventually lead to a static electricity discharge. This discharge can be small and go unnoticed, or it can be very large and potentially dangerous. If you have ever felt the hair on your arms stand up when near an unwinding roll of tape, you have felt static electricity. Films are particularly prone to creating a static build-up.



Why is static problematic for me?



- The discharge of static electricity could create a small shock, or it could build to the point that a lightning bolt-like spark will reach out and strike the operator, delivering potentially life-threatening voltage.
- Static discharge is a spark. Areas with flammable liquids or gases must remain spark-free at all times to avoid potentially life-threatening static build up.
- The release of energy seen and felt in a static discharge can damage the release liner of the product being unwound. When the silicone is disrupted by static it will no longer function as a release system in the area affected by the discharge.

Methods to control static

The first step to controlling static is to identify the ‘hot’ areas, or areas that seem to be generating the highest static charge. This can be accomplished with a small, inexpensive, handheld electrostatic field meter. In general, action should be taken when the charge approaches 10 (either +10 or -10). There are numerous ways to control static in your facility:

- **Humidity:** Keeping the relative humidity above 50% will lessen the likelihood of static. This can be accomplished with a humidification system, such as a simple series of water misters.
- **Static Tinsel** is a series of metallic strands extending from a copper wire core. Tinsel is mounted on the machine across the web in a ‘hot’ spot. The tinsel is most effective when it is 1/8”–1/4” away from the moving web. It must be properly grounded on the machine where it is installed.
- **Static String** uses conductive fibers woven into string form. It can be elastic or non-elastic and is mounted similarly to tinsel. String is effective up to 1” away from the web.
- **Static Bars** are highly efficient, electrically powered bars that are permanently mounted across the web for particularly troublesome static hot spots.
- **Static Blowers** are fans that blow positively and negatively ionized air at the moving web to neutralize the charged surfaces.



Conclusion/Recommendations

Consult a trained static control engineer to evaluate your facility and determine the best option for controlling static on your equipment. For the safety and well-being of your employees, your products, and your customers, it is critical to maintain a static-free environment.

For more information about static discharge and to view other technical papers, please visit our website at www.berryglobal.com/en/brands/adchem.

