

Silent Killer of Electronics

ESD (Electro-Static Discharge) is often deemed the “*silent killer of electronics*”. Bell Labs, conducted research in an effort to uncover the *underlying causes of electronic failures*.

Their findings were enlightening...

Bell Labs discovered that significant portion of “**ESD**” failures were actually either directly or indirectly caused by **corrosion**. This is a paradigm shift in the electronics industry.

How Corrosion Effects ESD/Electronics

When metals oxidize or corrode their electrical surface resistance increases. This equates to a poor ground. ESD circuits rely on good grounding to protect the micro-circuits from ESD event damage.

An ESD event produces more than the allotted electrical current through the component’s electrical paths, creating a potential overheating situation. This is the same as you might see when a fuse in a car or older houses experience when a short or circuit overload causes too much current to flow through the circuit. You will see a melted metal trace in the clear glass or plastic viewing window.

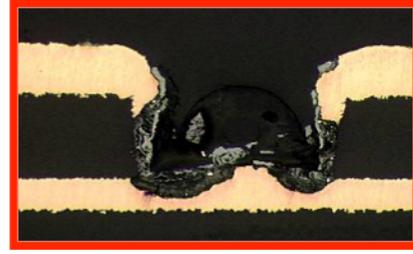
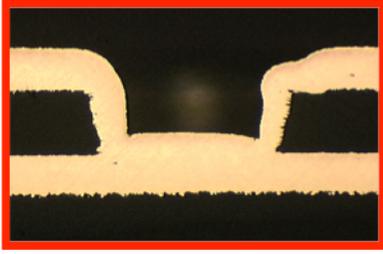
Micro-circuit traces (fuses) can be a million times smaller than typical fuses you see. So very miniscule currents (the type that occurs from an ESD) can cause the circuit to open.

Bad grounds caused by corrosion make this occur more frequent because the circuits have less ground protection.

The Bad & The Ugly

Typically, we equate corrosion with tarnish on a printed wiring board or on connectors. The same atmospheric pollutants and reactive gases (Sulfur, Chlorine, Ozone, Nitrous gases, etc.) that cause corrosion and attack printed wiring boards do so right **through sealed ESD bags**.

This damage has been seen in **as little as 6 weeks in Asia**. An example of corrosion of a printed wiring is seen in pictured below of a cross section of a PWB via:



- **Note:** the metal in this PCB via was *literally* consumed and transformed by corrosive gases, leading to a catastrophic failure, *despite being sealed in an ESD shielding bag*.
- This is because ESD bags DO NOT protect against gases. They are designed to protect against ESD events ONLY.

Some components fare even worse. The items depicted above looked like this after only **3 weeks** in a sealed ESD bag in China.

So what's the solution? It's certainly not dry packaging, considering that the corrosion depicted above was caused **not by humidity, but gases**. This means that keeping the parts below 37% relative humidity (the industry standard) would have had **little impact** on their corrosion rates.

The Good!

The solution to printed circuit board and electronics failures is indeed the use of ESD bags, wraps and shrink film. But, there is one important element that needs to be present: **Static Intercept®**.

Static Intercept® tabs are fully and permanently ESD safe because they're humidity, temperature and time independent. They provide long term, effective corrosion and tarnish protection **without the use of oil or volatiles**.

Furthermore, unlike most ESD shielding bags, Static Intercept® tabs are **NOT** subject to outgassing and do **NOT** produce non-volatile residue.

By implementing the same technology utilized by various industry leaders for over a decade, Static Intercept® will prove itself as the most effective way to protect your electronics, bare boards, PCB's and PWB's from degradation and oxidation.

[Click here to learn more about Static Intercept®](#)