



Recommended ESD Best Practices

General ESD Guidelines

- Keep people, machines, unwind/rewind equipment, tooling, and other conductive objects at the same electrical potential through appropriate grounding.
- Neutralize charge on process-essential insulators and moving webs with correctly selected, positioned, and maintained ionization.
- Minimize charge generation: reduce unnecessary web friction, uncontrolled peel/separation, rubbing, and high-speed air jets.
- Implement periodic static monitoring of equipment used in RFID conversion.
- Train personnel on general ESD risks and mitigation activities when handling RFID inlays.
- Recommend 100% inline multi-point RF testing as part of the conversion process.
- ESD events can occur anywhere in the conversion process, including after inline test.
- For more details, consult ANSI/ESD S20.20-2021 and IEC 61340-5-1:2024 which provide the framework for an ESD control program.

Understand the ESD Risk in RFID Converting

RFID inlays are ESD-sensitive products and converting can expose the product to static generated by continuous web motion, rollers, nip points, and rewinding.

Risk mechanism	Typical converting source	Potential consequence
Direct ESD	Person/tool/fixture contacts exposed inlay	IC damage
Charged-device event	Charged web, roller, conductive tooling, or inlay	Damage to the IC when charge finds a discharge path
Static buildup	Peel, unwind, rewind, slitting, lamination, rubbing	Charge accumulation on web or components, resulting in discharge and damage to the IC

Recommended Methods to Reduce Risk of Static Charges

1. Perform static assessment with the use of static field meter. Recommended static levels are not to exceed ± 2 kV at any point in the production process.
2. Grounding:
 - a. Establish a verified common-point grounding system appropriate to the facility.
 - b. Static control brushes and/or static control cord can be used along the web path as effective grounding solutions during the conversion process.
3. Ionization
 - a. Where the use of static control brushes and/or static control cords cannot be used, consider implementing ionization equipment (e.g. ionization fans, needle point ionizers, and/or air discharge ionizers).
 - b. Consult the ionizer original equipment manufacturer for installation, operation, and maintenance of the ionization equipment.
4. Environmental:
 - a. Recommend 40-60% relative humidity for the production area(s).
 - b. Low humidity environments should be avoided.

About Hana RFID

Hana RFID is the brand of Hana Technologies, a global manufacturer of ARC-certified RFID inlays and tire tags. IC-agnostic across all major chip platforms, we manufacture across the United States and Asia, serving customers worldwide in retail, logistics, supply chain, and tire manufacturing.

