ULTRA CLEAN IONIZATION™

ADVANCED STATIC CONTROL SOLUTIONS

Contamination and ESD Protection for EV Battery Manufacturing

SIMCO ION™

An ITW Company

Simco-Ion, Technology Group, a Worldwide Leaders in Advanced Ionization and Monitoring Solutions for ESD Control applications, is renowned for...

QUALITY. PERFORMANCE. RELIABILITY.

Simco-Ion, Technology Group delivers advanced ionization and monitoring solutions designed for the exact requirements of electric vehicle battery manufacturing. From dry-room electrode coating to pack-level assembly and end-of-line testing, our systems help manufacturers achieve.

Electric vehicle battery production demands ultra-clean environments and precise process control. Even the smallest particle or discharge event can impact safety, yield, and long-term reliability.

Simco-Ion, Technology Group partners with leading battery manufacturers to eliminate static and contamination risks across the entire cell and pack lifecycle. Our advanced ionization, monitoring, and instrumentation solutions are engineered for the industry's most critical needs.

-- From dry-rooms to final test, we safeguard your yield, your throughput, and your reputation --

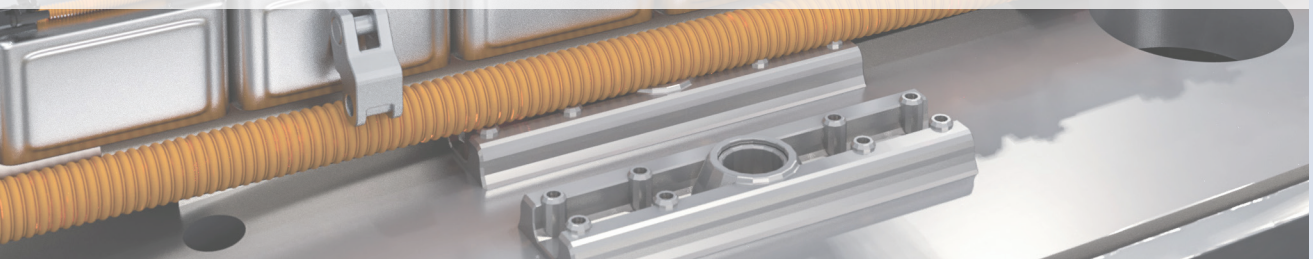
STATIC RISKS
in Electric Vehicle Battery Production

Static charge is generated throughout the electric vehicle battery manufacturing process—from electrode mixing and coating to slitting, stacking and winding, electrolyte fill, formation/aging, and pack assembly. Uncontrolled charge drives three costly problems:

Electrostatic Attraction (ESA): Pulls airborne particles onto wet coatings, separators, tabs, and PCBs—causing defects, increasing the risk of short circuits, reducing yields, and driving costly rework.

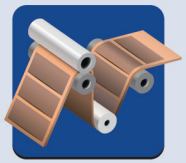
Electrostatic Discharge (ESD): Can damage BMS electronics and test fixtures, trigger latent defects, or create nuisance resets.

EMI from ESD: Discharges can upset automation, cause tool alarms, and interrupt production flow.

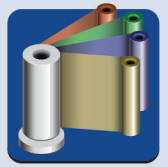


SLURRY PREPARATION
Moisture intrusion and static buildup can cause poor electrode wetting and contaminate active material

COATING & DRYING
Electrostatic charges can lead to uneven slurry distribution, dust attraction, and coating defects

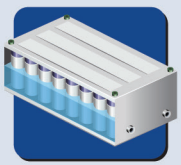


CALENDERING
High-speed rolling generates triboelectric charges that can damage equipment or degrade film uniformity



SLITTING & CUTTING ELECTRODES
Static from cutting draws contaminants that compromise edges and lamination quality

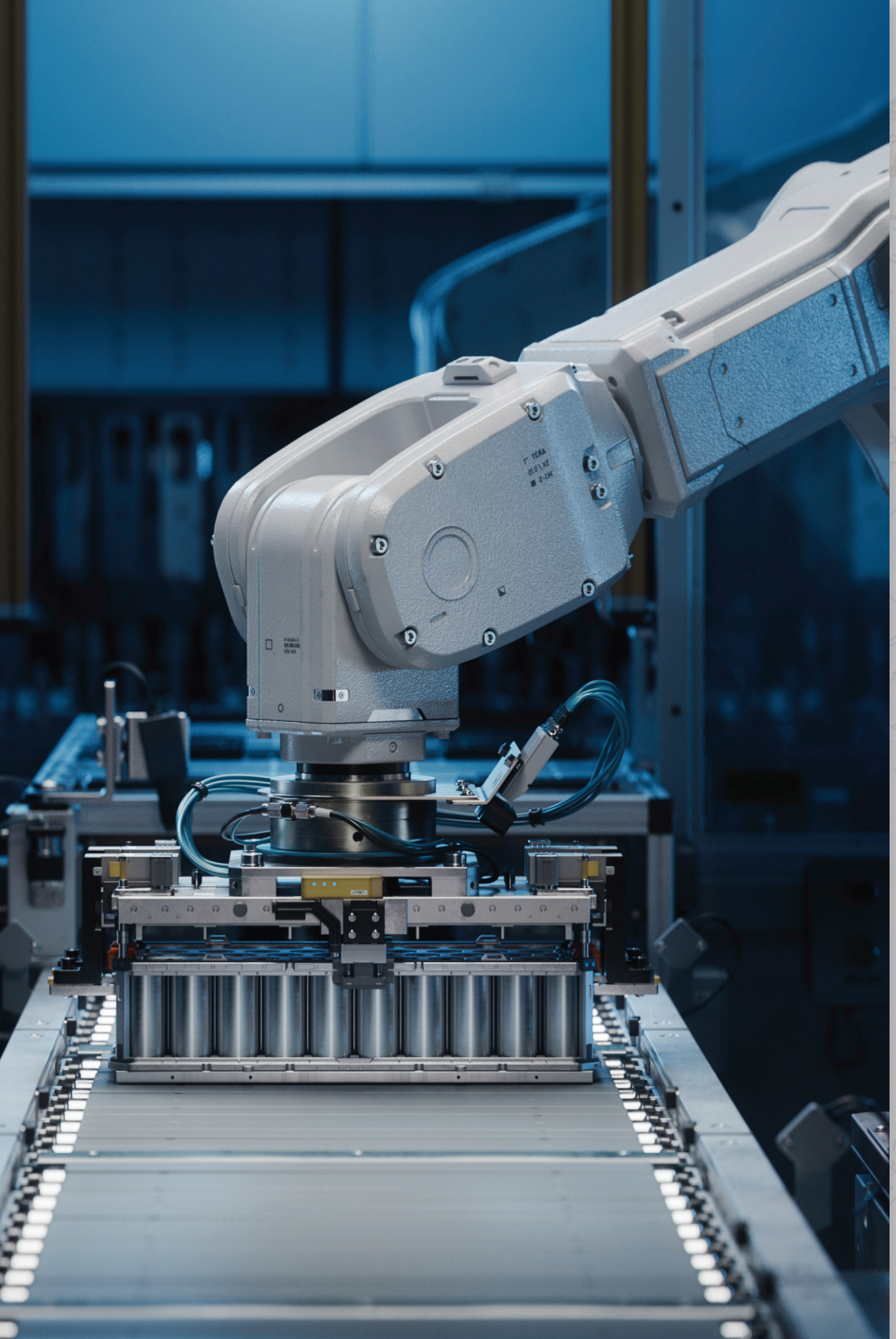
CELL ASSEMBLY
Static attracts particles between layers or to separator films, increasing short-circuit risk and reducing yield



ELECTROLYTE FILLING & FORMATION
Surface charge can disrupt electrolyte flow and formation stability

MODULE ASSEMBLY
Static can damage sensitive components in power management system and cooling systems

FINAL TEST & QA
Latent defects or static charge can disrupt sensitive test equipment



ESSENTIAL REQUIREMENTS

For Electric Vehicle Battery Manufacturing Assembly Lines

Advanced ESD Protection

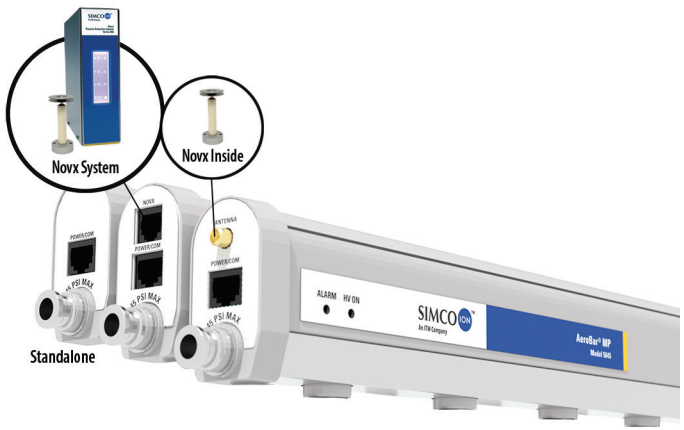
Smart ionization with the Novx Advantage adds detection, measurement, recording, and continuous monitoring—preventing instant and latent failures and protecting yield across cell and pack lines. (Parallel to your Industry 4.0/Novx narrative.)

Tight Voltage Control

Dry-room processes and BMS/test areas benefit from ultra-low offsets at the point of risk. Maintain consistent neutralization performance to mitigate discharges near coated webs, slitting knives, winding/stacking stations, and ICT/EOL test.

Monitoring and Traceability

Closed-loop feedback, automated decay checks, and event logs support compliance, SPC, and root-cause analysis—aligning with Industry 4.0 initiatives. (Match the compliance/traceability/advance notifications set called out in the reference.)



ADVANCED IONIZING BAR

Modulated Pulse Technology with Novx Feedback & Control Capability

Achieve industry-leading ionization performance with unmatched ±20V balance precision.

Exceptional Performance

- Industry-leading offset voltage performance with ±20V balance.
- Real-time monitoring and feedback control using Novx Technology brings control down to ±5V balance.
- Low swing voltage ensures safe placement as close as 150 mm from wafers or reticles.

Convenient Software Control

- User-friendly interface for easy setup and adjustments.
- Centralized power control with full remote management via PC.

Design Options

- Choose from 3 versions and 14 different lengths to fit your specific application.

INDUSTRY 4.0 REQUIREMENTS

Smart Manufacturing with Novx Advantage

The Novx Electrostatic Control Management System is a comprehensive solution designed to meet Industry 4.0 requirements. It detects, measures, records, and monitors electrostatic voltage, ensuring compliance and enhancing manufacturing efficiency.

Compliance | Traceability | Process Management | Advance Notifications

The Novx Advantage also integrates advanced sensors with closed-loop feedback to maintain ionizer balance and conduct automatic decay testing—delivering unparalleled control and assurance in today's smart manufacturing environments.

ENHANCED OVERHEAD BLOWER

Multi-Fan with Novx Feedback & Control Capability

Experience industry-leading electrostatic performance with a choice of 2-, 3-, or 4-fan configurations. Equipped with a 24 VDC input and an integrated Auto-Clean system in each fan, this overhead blower helps minimize maintenance time and costs while delivering exceptional ±3V balance precision.

Unmatched Performance

- <±1V balance capability with Novx closed-loop feedback.
- Superior offset voltage and feedback control for optimal efficiency.

Superior Design Options

- Standalone: Ideal for straightforward, reliable ionization.
- Novx Inside: Incorporates passive sensors to monitor offset voltage.
- Novx System: Adds active sensors for decay time testing, ensuring peak performance and compliance.

STATIC CHARGE PROTECTION

From Point-of-Use to Room Scale

Our portfolio spans micro ionizers, nozzles, and compact blowers for tight mechanisms; overhead blowers and bars for lines and bays; and full room ionization—neutralizing charge during transport, handling, coating, slitting, stacking and winding, tab processing, fill and seal, and test.

Comprehensive Range of Ionization Solutions

Simco-Ion, Technology Group delivers proven static-control solutions for every stage of electric vehicle battery manufacturing. From precision tools in electrode processing to wide-area ionization in dry rooms and formation bays, our systems are designed to reduce particle-related defects and protect sensitive electronics.

Targeted Protection for EV Battery Lines

Benchtop & Point-of-Use: Hands-free nozzles and compact blowers to neutralize charge at fill, seal, and pack assembly stations.

Overhead Blowers & Bars: Wide-area coverage for coating, slitting, winding, and EOL test environments.

Room Ionization Systems: Distributed ceiling solutions for large dry rooms and formation and aging chambers.

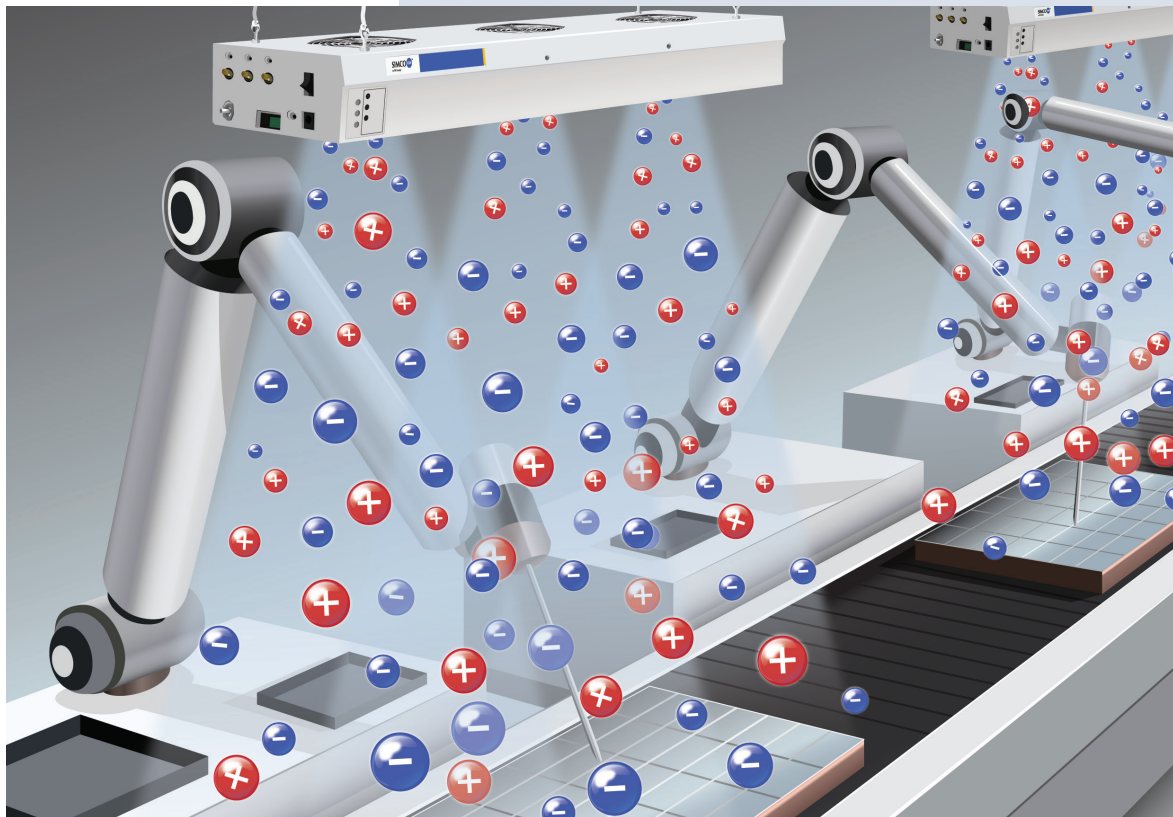
Ensuring Yield, Compliance, and Safety

In high-volume electric vehicle battery production, effective electrostatic control is essential to maintain product quality, reduce scrap, and support compliance with safety and reliability standards. Our ionization solutions safeguard both processes and people, helping manufacturers stay competitive in the fast-growing electric vehicle market.

Typical electric vehicle applications where ionization solutions are essential in improving productivity:

EV Battery Manufacturing

- Electrode Coating
- Electrode Drying
- Calendaring
- Slitting
- Roll Handling
- Stacking
- Winding
- Tab Weld Prep
- Electrolyte Fill
- Electrolyte Seal
- Electrolyte Leak Test
- Formation Rooms
- Aging Rooms
- Module Assembly
- Pack PCB Assembly
- EOL Test



WHY STATIC CONTROL MATTERS IN EV BATTERY MANUFACTURING ENVIRONMENTS

Static charge and fine particle contamination are invisible but costly threats to lithium-ion battery manufacturing. Even in dry rooms, metallic dust, separator punctures, and electrostatic discharge can reduce yields, degrade performance, and trigger thermal runaway events. Building a defect-free EV battery isn't just about chemistry and design—static charge and fine particle contamination can undermine even the most advanced production lines.

PARTICLE CONTAMINATION

Metallic dust/fine particles can embed in electrodes, puncture separators, cause defects that affect performance/safety.

COMPLIANCE & SAFETY ISSUES

Meeting ESD and safety standards demands ongoing monitoring, documentation, process integration.

YIELD LOSS FROM MICRO DEFECTS

Even submicron particles can cause defects or short circuits, driving up scrap and rework.

DRY-ROOM CONSTRAINTS

Ultra-low humidity needed for chemistry stability also increases static buildup and limits traditional cleaning.

SCALING TO GIGAFACTORY

Quality, stability, and contamination control become harder at high production speeds and volumes.

ELECTROSTATIC DISCHARGE RISKS

Uncontrolled static can damage electronics, puncture separators, or trigger thermal runaway in high-voltage modules.

PRODUCT SOLUTIONS

ADVANCED IONIZING BARS

- Modulated Pulse Technology
- ±20V balance; low swing voltage
- Air-assist capability
- Software control & remote management
- Multiple lengths

OVERHEAD IONIZING BLOWERS

- 2-3-4 fan configurations
- <±3V balance capability
- Integrated auto-clean per fan
- Standalone, Novx-Inside, or Novx System

IONIZING AIR GUNS & NOZZLES

- High blow-off force
- Flexible mounts
- Hands-free options

STATIC CONTROL MONITORING

- Closed-loop Feedback & Control
- Continuous verification
- SPC data logs
- Quick audits

INSTRUMENTATION

- Portable for quick static audits
- Probe system for decay & balance checks
- CPM for SPC & compliance
- Fast verification of ionizer performance

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