

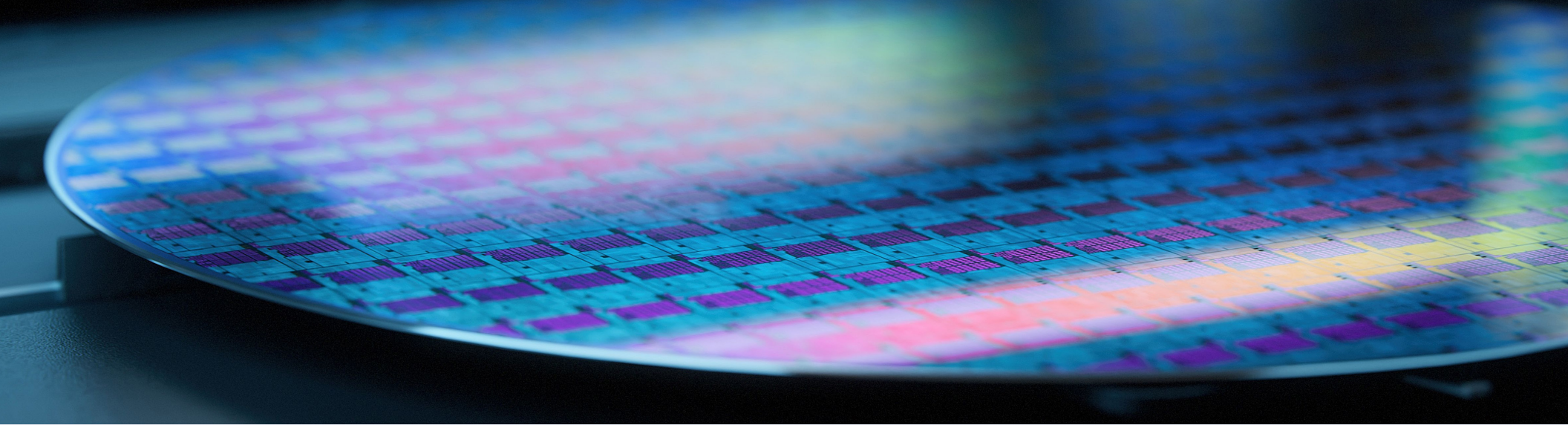


ULTRA-CLEAN ELECTROSTATIC CONTROL

for Front-End
In-Tool & Cleanroom
Semiconductor Manufacturing

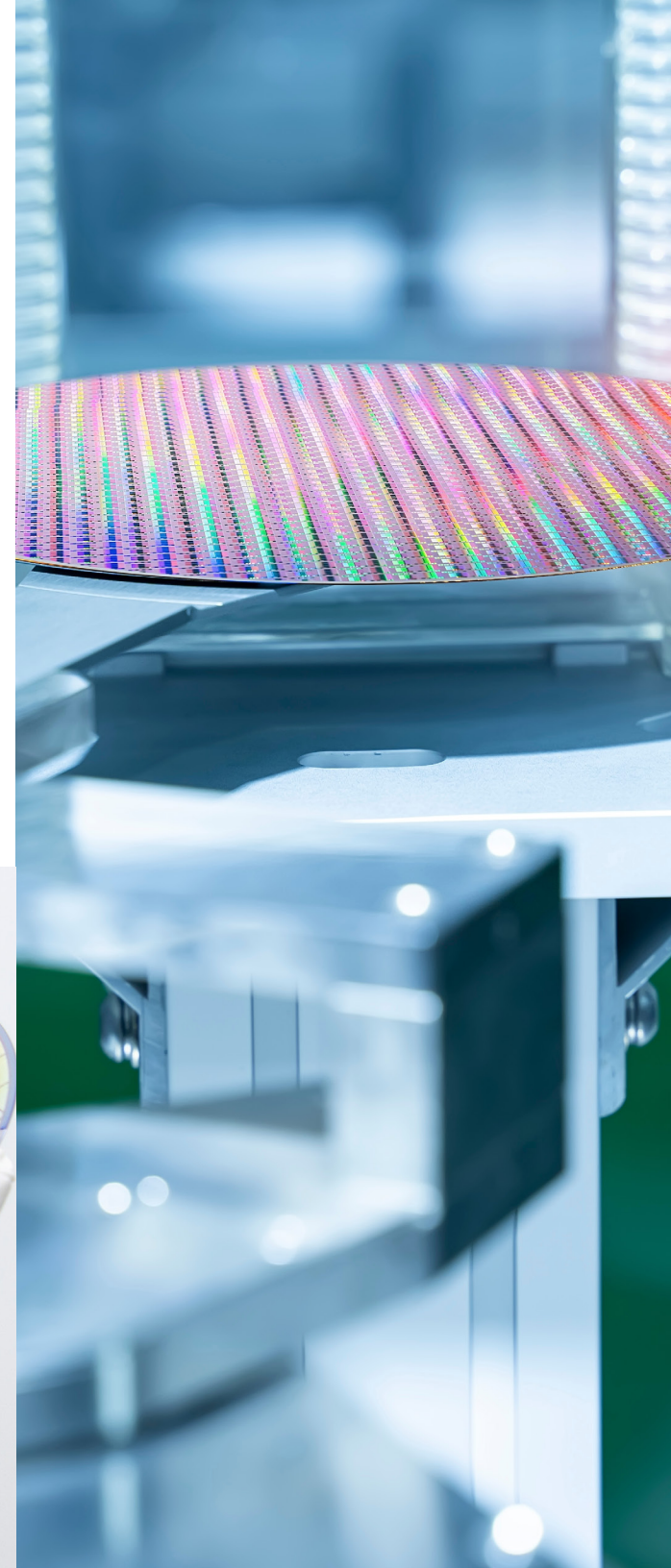


SIMCO IONTM
An ITW Company



STATIC CHARGE *in* Semiconductor Manufacturing

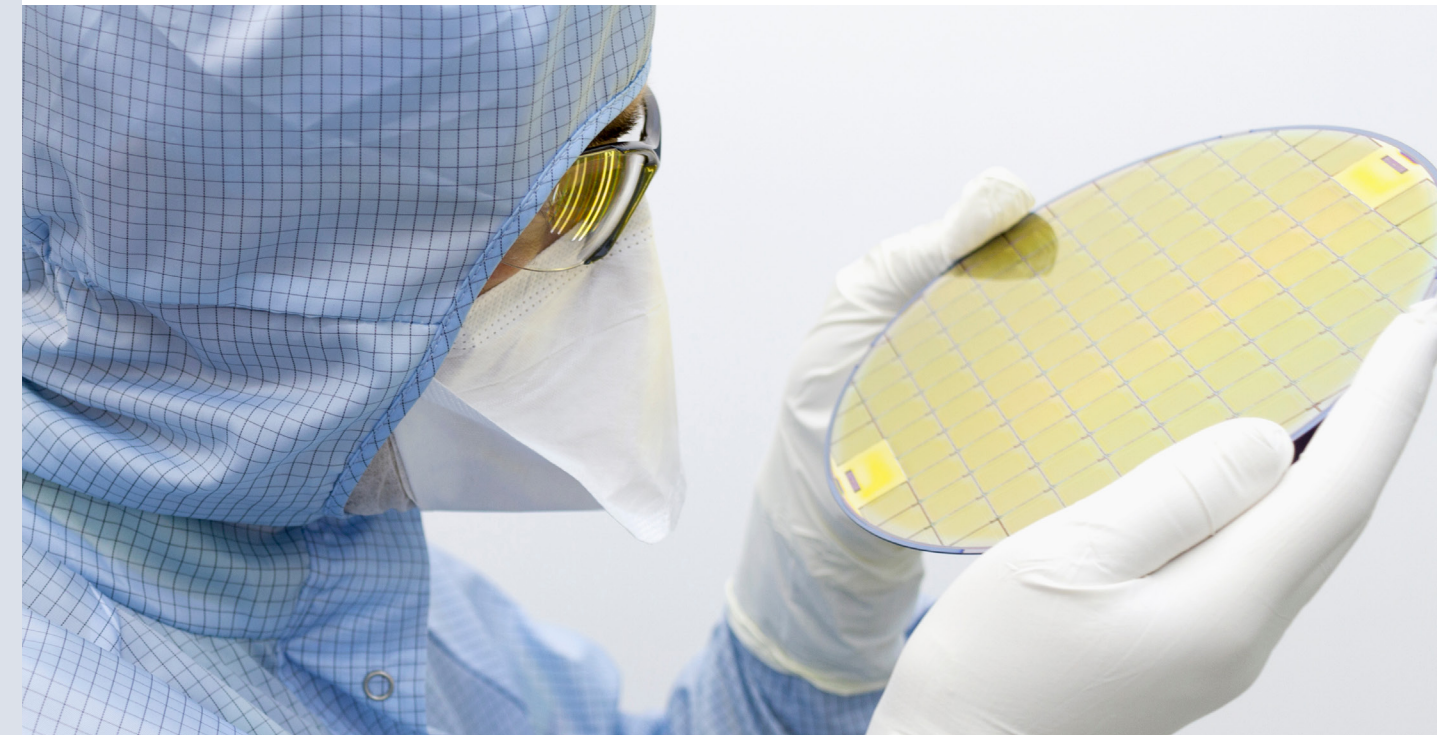
Static charge, generated throughout the semiconductor manufacturing process, is caused primarily by the contact and separation of dissimilar materials. Static charge affects productivity and yield in three ways. Static charge electrostatically attracts (ESA) particles from the air causing potential yield loss on wafers and reticles. Electrostatic discharge (ESD) of voltages causes instant or latent defects on reticles, wafers, or packaged chips. Electrostatic discharges can also create electromagnetic interference (EMI), triggering microprocessor lockup and robotic malfunctions that lead to product flow interruptions and costly tool downtime.



Simco-Ion, the global leader in ionization solutions in electrostatic and particulate contamination control, is renowned for...

INNOVATIVE | QUALITY | RELIABILITY | SERVICE

Simco-Ion delivers **ULTRA-CLEAN** ionization solutions for in-tool and cleanroom applications, offering bars, room systems, overhead blowers, and in-line technologies. **ULTRA-CLEAN** ionization products meet/exceed customers' ESA (Electrostatic Attraction) airborne particle control requirements and their ESD (Electrostatic Discharge) control limits, well advanced of today's market voltage requirements (currently at 35V, with anticipation of innovation challenges to 5V or lower). **ULTRA-CLEAN** ionization technology solutions improve/minimize product yield loss caused by device damage and latent defects for the Semiconductor Front-end industry. Look to Simco-Ion for the next-generation of advanced ionization equipment and solutions.



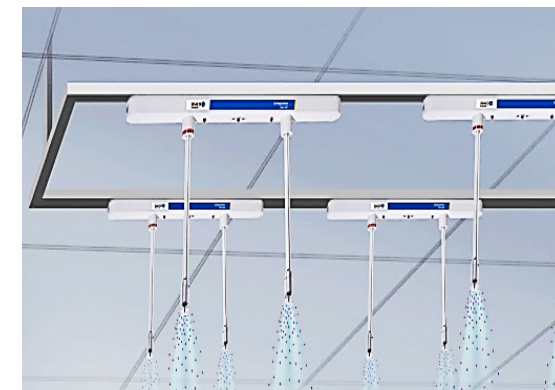


ESSENTIAL REQUIREMENTS For Today's Semi Front-End Manufacturing Industries

Ultra-Clean Environment – In an ultra-clean environment where airborne particles control is critical to eliminate/minimize Electrostatic Attraction (ESA), particulates ultimately may cause latent failures, contamination, low-quality products, and yield loss.

Voltage Control – Tighter voltage control requirements will eliminate/reduce Electrostatic Discharge (ESD) in the sensitive electronics manufacturing process, causing active device damages and/or latent defects. Tight offset voltage with increasingly better decay time protects products/devices from ESD damage and the ultra-clean processes.

Monitoring – Meeting Industry 4.0 requirements, monitoring with NOVX Complete Electrostatic Control Management System with active feedback & control enables traceability, compliance, process management, advance notification and much more.



ULTRA-CLEAN PERFORMANCE *Digital Room Ionization System for Wide Area Coverage*

Awarded numerous patents, this room system is considered the most effective and reliable system available in the market today.

- **Performance:** High-ion output prolong periods and stable performance.
- **Precision Control:** Robust software with programmable parameters individually set at location or by remote.

Optimal design for any ceiling: Only 17.7"/450 mm wide with numerous rods lengths to accommodate ceiling height and target distance; and just 16.4 oz/645g.

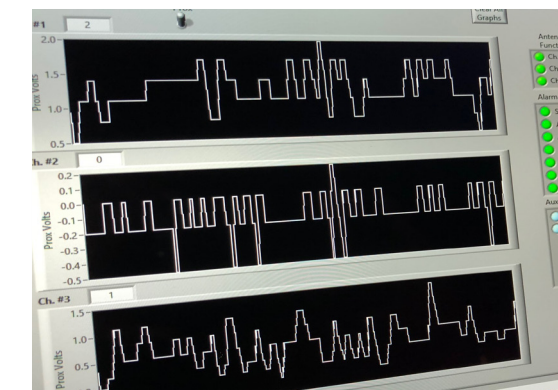


ADVANCED IONIZATION BAR *Modulated Pulse Technology with Active Feedback/Control*

The most advanced performance ionization bar with amazing $\pm 5V$ balance performance.

- **Performance:** Industry-leading offset voltage performance; $\pm 5V$ balance with Novx monitoring; offset voltage and feedback control. Low swing voltage for safe placement as close as 150 mm of wafer or reticle.
- **Software Control:** User-friendly, and wide adjustability for centralized power, 100% remotely control via PC.

Superior design options: Available in three design options and 14 lengths.



INDUSTRY 4.0 REQUIREMENTS *Smart Manufacturing with Novx Advantage*

Novx Electrostatic Control Management System; a complete system that simultaneously detects, measures, records, and monitors electrostatic voltage to meet the requirements of Industry 4.0.

**Compliance | Data Management
Traceability | Process Management
Monitoring | Advance Notifications**

Novx advantage adds sensor capabilities with closed-loop integration to monitoring the manufacturing environment while controlling the ionizer balance and performance automatic decay testing.

STATIC CHARGE PROTECTION

Our comprehensive portfolio of static charge control solutions address all stages of wafer manufacturing from in-tool requirements and room environments to test, assembly, and packaging applications.

Typical semiconductor Front-end applications where ionization and monitoring solutions are essential in improving productivity:

Wafer Manufacturing	
Cleanroom	In-tool
<ul style="list-style-type: none"> • Photolithography • Reticle Storage • Wafer Handling/Transfer • FOUP Wash • Wafer Starts 	<ul style="list-style-type: none"> • Wet Process • Thermal Process • Implant • Etch • Deposition • Wafer Sort



WAFER MANUFACTURING (CLEANROOM ROOM SYSTEM IONIZATION)

Model 5515 Room Ionization System protects the cleanroom, gowning room, the entire manufacturing area. The state-of-the-art system comprises ceiling emitters, a controller, and robust software for monitoring capabilities. Digital technology allows each ceiling emitter's parameters, including ion output, ion pulse timing, and digital address, to be individually set at its location. Precision fine-tuning of each ceiling emitter enables the ionization system to achieve maximum performance in any airflow condition and for each application.



WAFER MANUFACTURING (IN-TOOL)

Inside tools' mini-environments and EFEMs, our most advanced, state-of-the-art Model 5645 AeroBar MP not only meets ISO 14644-1 Class 1 cleanliness (10 particles or less per m³ for 0.1 microns and larger) but surpasses ISO Class 1 meetings Extended ISO Class 1* cleanliness for ≥10 nm particles. Thus, providing the cleanest bar ionization available for leading-edge wafer technologies in an ultra-clean environment for the semiconductor manufacturing process.

HIGH-TEMPERATURE ENVIRONMENTS

The Model 4612 Extreme Temperature Ionization System, designed to withstand temperatures as high as 150°C (302°F), as low as -50°C (-58°F), eliminates charges developed in test chambers with active robotics moving parts under extreme environments. The system includes the 4062e Controller and a remote sensor for feedback and control. Available in three lengths—500 mm, 210 mm, and 114 mm, the new member of the family, 4612 Mini.



NITROGEN OR CDA APPLICATION ENVIRONMENTS

In the heart of process equipment, where space is limited or in proximity to sensitive products, Model 4210 in-line gas ionizer is the perfect solution; piping compressed ionized gas for balanced charge neutralization. An ultra-clean ionization solution using 99.99% nitrogen provides an ionized gas output in drying and chemically harsh environments for leading-edge processes using nitrogen.



* For more info on "Extended ISO Class 1", refer to Apps Note 026 & 027.

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Visit the Resources page for product videos and numerous technical papers.

