SIMCO ION™
An ITW Company

Aerospace Market
CASE STUDY

Eliminate ESD/Particle Contamination Using Ionization

Aerospace Defense Electronics Manufacturer

An aerospace defense electronics manufacturer faced persistent electrostatic discharge (ESD) and particle contamination issues in its cleanroom environment, leading to increased defects and production costs. By implementing ionization technology along with enhanced grounding, air filtration, and personnel training, the company significantly improved product quality, reduced rework, and ensured compliance with industry standards.

Problem

The manufacturer encountered two major challenges:

1. **Electrostatic Discharge (ESD)**: Static buildup damaged sensitive electronic components.
2. **Particle Contamination (ESA)**: Airborne particles adhered to charged surfaces, reducing product reliability.

These issues resulted in higher defect rates, increased rework and scrap costs, and potential risks of non-compliance with industry regulations.

Solution

The company implemented a multi-faceted strategy to address ESD and ESA challenges:

- **Ionization Technology**: Installed Room Ionization grid, overhead and benchtop ionizers, and ionizing air guns in various locations to neutralize static charges.
- **Enhanced Grounding Measures**: Upgraded ESD-safe workstations, flooring, and grounding protocols for personnel and equipment.
- **Improved Air Filtration**: Enhanced HEPA filtration systems and optimized airflow patterns to reduce particle contamination.
- **Personnel Training**: Conducted extensive training on ESD awareness, cleanroom protocols, and prevention techniques.
- **Monitoring and Control**: Implemented continuous monitoring of static levels and particle counts, along with regular audits and system adjustments.

Results

- 85% reduction in ESD-related defects
- 70% decrease in particle contamination incidents
- 30% improvement in product yield
- 25% reduction on rework and material scrap costs
- Successful compliance with aerospace industry standards (e.g., AS9100)
- Increased customer satisfaction due to enhanced product reliability

Key Takeaways

1. **Integrated Approach**: Combining ionization with other preventive measures ensured maximum effectiveness.
2. **Continuous Monitoring**: Real-time data allowed quick adjustments and optimal conditions.
3. **Employee Engagement**: Proper training played a critical role in the success of new protocols.
4. **ROI**: Despite initial costs, the improvements led to significant cost savings in a short period.

By leveraging ionization technology and complementary measures, the manufacturer successfully eliminated critical ESD and particle contamination challenges, setting a benchmark for high-precision cleanroom manufacturing.