ESD Open Forum

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Q: We have automated assembly equipment inside class 100 enclosures, and due to the ESD-sensitive devices being handled, were forced to install ionizing blowers in the equipment. While the ionizers have helped reduce ESD damage to the product, some of the point-of-use particle counters being used in the tools are now alarming more often. Can you give any insight to the problem and how to resolve it?

A: The use of enclosures around tooling is common, and if they are designed properly, the airflow within them should be uni-directional. The advantage of this is that debris generated by the robots, process tooling, and the process itself is not stirred up, and instead either stays in place or is taken away by the air handling equipment. The disadvantage is that debris generated may not be detected during normal operation, even by point-of-use, continuously monitored equipment.

Ionizing air blowers, by their very design, create turbulent airflow, and for that reason are sometimes banned from cleanroom operations. Further, older ionizers did not use cleanroom compatible materials and designs, and so were justifiably banned from cleanrooms. Newer ionizing blower designs by a few companies have been designed specifically for cleanroom use, and although their airflow is still turbulent, they are made with emitters and motors that do not generate excessive contamination.

I would use the data from your real-time, point-of-use particle counters to justify going in and finding the source of the contamination problem. The thing to remember is that just because the particle counter isn't picking up contamination, it doesn't mean that you don't have a contamination problem, and possibly the ionizer is now assisting you in finding out that you indeed have a problem.

I would procure a 1 cfm (cubic feet per minute) particle counter and use it to "sniff" out probable sources of contamination while the tooling is in operation. Look for bearings, air solenoids, magnetic actuators and other moving parts. It is also possible that a simple change to the tooling wipe down frequency or process might solve the problem.

Turbulent airflow in a cleanroom environment may not always be a bad thing, as it can sometimes help you find problems that are being masked by the cleanroom design.

About the Author

Carl Newberg is the President of MicroStat Laboratories/River's Edge Technical Service, an independent testing laboratory and consulting service to the static and contamination control industries. He is a NARTE Certified ESD Engineer and an ESD Association Certified ESD Program Manager. He is currently the Contamination Control Senior Scientist for Magnecomp Precision. Carl has been a member of the ESD Association since 1995, and is an active member of the Standards Committee, participating in working groups on ionization, packaging, cleanrooms, garments and gloves. Carl was the Technical Program Committee Chairman for the 2004 EOS/ESD Symposium, the Vice General Chairman for the 2005 EOS/ESD Symposium, and the General Chairman for the 2006 EOS/ESD Symposium.

About the ESD Association

Founded in 1982, the ESD Association is a not for profit, professional organization dedicated to furthering the technology and understanding of electrostatic discharge. The Association sponsors educational programs, develops ESD standards, holds an annual technical symposium, and fosters the exchange of technical information among its members and others. Additional information may be obtained by contacting the ESD Association, 7900 Turin Rd., Bldg. 3, Rome, NY 13440-2069 USA. Phone: 315-339-6937. Fax: 315-339-6793. Email: info@esda.org. Website: http://www.esda.org.