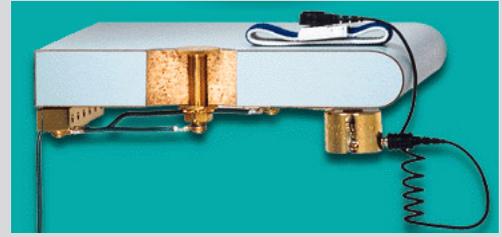


TEST RESULTS

“Getting Grounded”

By Jennifer Hazen,
Editor

The art (or is it science?) of grounding personnel at ESD safe workstations is much more developed than even I realized before my interview with Bette Palmisano of Work Surfaces Corporation. Ms Palmisano says that the use of top quality hardware allows a very reliable grounding system with less chances for breakage or disconnects.



At an ESD safe workstation personnel must use wrist straps to ensure they are grounded and therefore drain or dissipate static charges which could wreck ESD sensitive items. These wrist straps usually have a 1 Meg Ohm resistor in their connector or wiring which protects the wearer from hazardous electrical potentials. The connection of the workbench and ground is usually through a “banana” plug or “alligator” clip.

Work Surfaces Corporation as well as other companies supply a variety of sophisticated connection hardware to provide reliable grounding means for personnel and workbenches.

One major problem encountered by wrist strap users is the stress placed on the connection and wiring during normal use. This stress placed on the wire and plug of the wrist strap as the user moves around eventually will cause a break and loss of grounding. This renders the wrist strap inoperative. Most companies require wrist strap users to check the wrist strap before beginning work each day. Some require the user to check the connection each time they return to their work area after break, lunch etc. Many companies use continuous monitors on the wrist strap connection. If a wrist strap wire or connector breaks between operational checks, all parts handled since the last check are suspect and probably should be tested if not discarded.

Work Surfaces Corporation has developed a unique connector system to help eliminate the problem of stress on the wiring and connector. They have a neat 360 degree swivel connector that moves with the user as they perform their job tasks. (picture swivel in desk with wrist band only)

We tested the connector over an extended period of time and found it worked flawlessly. In fact we saw no change in resistance during our entire test. The resistance varied between 0.1 Ohms and 0.2 Ohms. We looked at the connection with an oscilloscope while the connection was loaded with a small amount of electrical current \approx about 10 mA. We saw virtually no “scratchiness” in the signal < 0.01 nV. This is a good test for the integrity of the connection under use or as it swiveled. We found the swivel connector to be highly functional and exceptionally reliable.



One other very important issue with grounding ESD workstations is the ability to connect the groundable point to the work bench surface which is usually multi layer. In other words, the ability to connect to the buried conductive layer is difficult. Special connectors are available from Work Surfaces Corporation which have “teeth” that bite into the conductive layer and make very good contact.. Our tests of these connectors proved as satisfying as for the swivel connector. We delaminated a worksurface to expose the inner conductive layer so we could connect directly to that layer . We installed one of the Work Surfaces Corporation connectors and measured the resistance to the conductive layer. We found the resistance to be approximately 1 Ohm at 10 Volts.

Vaughan Roundtree who works at Rockwell Collins in Atlanta is a user of the Work Surfaces grounding systems. She said that in the past then had to work hard $\&$ sanding etc. $\&$ at getting a good connection to the table top conductive layer but with the Work Surfaces hardware, they always got good connections with no problems. Vaughan said the systems are very “3M” friendly. This comment led to Dave Swenson of 3M Corporation. Dave said the Work Surface hardware have been used by 3M customers for several years with no complaints or problems. He stated that this type of system provides the very reliable connection required by constant monitoring systems.

The use of proper personnel grounding is the most important part of a well designed ESD control program. Today, connecting personnel and their wrist straps to ground is as simple as acquiring the proper hardware.