

ESD Worksurfaces

The ESD protected working area should provide for charged items to have static electricity removed through the worksurface to ground. It also keeps all conductors placed on its surface grounded, i.e., at ground potential which should be equal to the operator to theoretically eliminate the possibility of an ElectroStatic Discharge event.

There is a very good reason to use dissipative surfaces for balancing charge imbalances. The rate of charge balance removal is dictated by the resistance of the worksurface material. The faster the energy transfers to ground, the more likely a damaging ESD event, a large current pulse with sufficient energy to damage ESD sensitive devices. ESD control has evolved to minimize the risk of ESD Events. By slowing down the rate of charge (current) removal, the energy density is reduced. The ESD Association Worksurface standard ESD S4.1 recommends dissipative worksurfaces, 1×10^6 to $< 1 \times 10^9$ ohms, will discharge a charge imbalance to ground in plenty of time, typically significantly under 100 ms.

Per ESD Handbook TR20.20 section 5.3.1.7 Electrical Considerations “The most important functional consideration for worksurfaces is the resistance from the top of the surface to the groundable point. This establishes the resistance of the primary path to ground for items, placed on the surface. When worksurface materials are being selected, consideration should be given to possible Charged Device Model (CDM) damage to ESD sensitive products. If CDM damage is a concern then setting a lower resistance limit for the worksurface should be considered. Typically, the lower limit for these types of worksurfaces is 1×10^6 ohms.”

Per ESD S4.1 paragraph 8. Resistance Guidelines

“Due to wide variety of applications for worksurfaces, specific requirements that could be broadly applied are difficult to determine. However, the following set of guidelines can be used as a starting point for establishing local requirements for the resistance of worksurfaces.

- Resistance-to-groundable point 1×10^6 to 1×10^9 ohms.
- Resistance from point-to-point equal or less than 1 megohm

These guidelines represent a range of resistance that has generally been proven to provide protection in the manufacturing environment.”