Precision Polymer Engineering

Advanced sealing solutions for critical applications

# Dissipative End Effector Pads
# For Semiconductor Applications

## Wafer handling components utilizing advanced dissipative elastomers to reduce electrostatic discharge damage.

**PPE has developed a range of dissipative elastomers specifically designed for use in semiconductor manufacturing applications. These materials do not contain any metal components and other incompatible and undesirable elements that can cause contamination.**

Semiconductor wafers and processes, by the nature of materials required, are conducive to creating charge imbalances.

Electrostatic discharge (ESD) is a key factor in device failure. This is especially true for smaller feature sizes with a greater potential for ESD to cause immediate catastrophic failure or, for devices to be partially damaged leading to shipment of low quality parts and premature system failures within the end product. The overall cost of ESD damage to the semiconductor industry runs in to several billions of dollars.

### Summary

- **Dissipative elastomer components that minimize the occurrence of ESD events**
- **No metallic based fillers that can lead to contamination and changes in device characteristics**
- **Unique dissipative material developed specifically for the semiconductor market**

# Dissipative End Effector Pads for Semiconductor Applications

## Unique materials specifically for the semiconductor market

Building on an extensive range of high performance elastomers that are already commonly used in many semiconductor process tools, PPE has developed a range of compatible materials to combat triboelectric charging and reduce ESD damage.

Unique FKM and FFKM materials have been tuned to achieve a volume resistivity within the dissipative range. These dissipative materials avoid the use of carbon black or metallic based fillers such as silver, nickel and copper which could lead to uncontrolled contamination and degradation of device characteristics.

These new materials can be molded into customized designs or shapes suitable for any relevant application where electrostatic charging is undesirable.

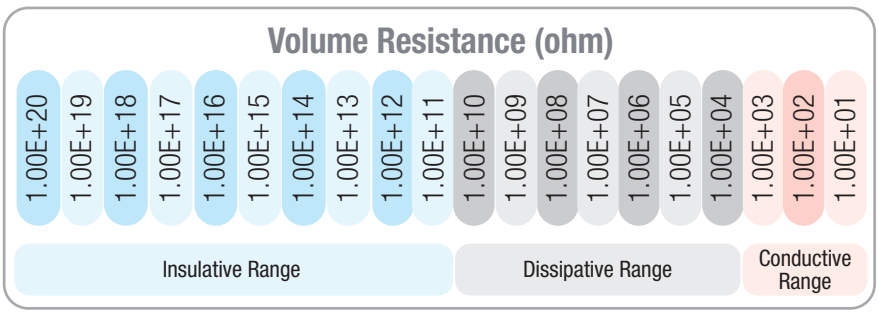
## Why choose PPE End Effector Pads?

There can be upwards of a thousand individual process steps required to create many of the devices used in common everyday electronic systems. Each step can involve multiple wafer handling procedures where wafers commonly rest on an insulating material installed within robotic handling systems. Simple pick and place operations are sufficient to create charged surfaces which can either contribute to ESD events or, cause electrostatic attraction of potentially damaging particles.

Improved profitability for device manufacturers can be realized through the use of appropriate dissipative handling materials that will not contribute other semiconductor-incompatible contaminants. This is achieved through improved yield, reduced need for costly rework and improvement in field failure rates and hence lower warranty costs.

### Key Benefits:-

- **Improved wafer yield**
- **Reduced cost of rework**
- **Reduced cost of warranty**
- **Improved profitability**




Electrostatically dissipative materials need to have a defined volume or surface resistance between that of insulating and conducting materials between $1x10^{4}$ and $1x10^{11}$ ohms.

This creates a slow leakage path to ground and avoids charge build up on the material itself.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