

ESD PRODUCT QUEUE

ESD means Electrostatic Discharge, which is the accumulation of electrical charge by an object, due to friction, contact or even a charge that is already on the electronic components due to some potential difference and which then discharges this accumulated charge onto another object.

Naturally, commodity plastics such as polypropylene (PP) are strong electrical insulators. Therefore, polymeric products must be specifically formulated for this application.

BUT WHY CANNOT STANDARD POLYMERIC PRODUCTS - ELECTRICAL INSULATORS - BE USED FOR THE TRANSPORTATION AND STORAGE OF ELECTRONIC EQUIPMENT?

Since insulating products do not have the capacity to transport electrons (e^-) efficiently, any static electricity that exists in the components will accumulate there. This accumulation, which cannot be discharged due to the polymer insulation, may cause these components to burn or malfunction.



No transport of e^- as they are accumulated on the surface of the box

AND CAN AN ELECTRICAL CONDUCTING BOX BE USED?

No. A shipping/storage box that has a high conductivity (metallic, for example) will also cause damage. This is because high conductivity will cause the electrostatic discharge from the component to the box to be abrupt, and since electronic equipment is often sensitive to static electricity, this rapid discharge is potentially harmful.



Rapid and abrupt transport of e^-

SO, WHAT SHOULD BE USED TO PROTECT ELECTRONIC COMPONENTS?

The Pisani ESD queue is the best option, as its products are formulated in polypropylene and have additives that reduce the surface resistivity (p) of the polymers to a specific value that causes the accumulation of electrostatic charge to be discharged in a controlled manner, neither abruptly nor too slowly, in order to protect the electronic components. They are commonly called dissipative boxes (p = between 10^6 and $10^{11} \Omega.m$), as they are at a level between conductive ($p \leq 10^5 \Omega.m$) and insulating ($p \geq 10^{12} \Omega.m$) characteristics.



Controlled transport of e^-

Source: TELLES, Dirceu D'Alkmin; NETTO, João Mongelli. Física com aplicação tecnológica: Eletrostática, eletricidade e fenômenos de superfície. Volume 3, São Paulo: Blucher, 2015.