

Application on an electronic part carrier

Support the electronics industry by preventing a trouble associated with static electricity

We often feel static electricity, for example when taking our clothes off or touching a door knob in dry ambient during the winter. In many industrial manufacturing processes, measures are taken to prevent electrostatic troubles. This issue features functions of our antistatic agent used in the electronics industry that requires sophisticated antistatic measures.

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TOPICS

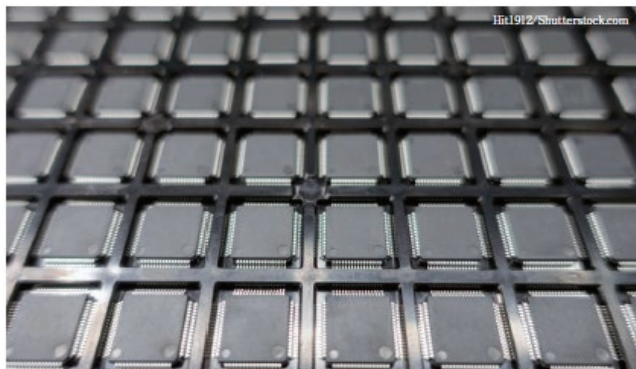
Static electricity can cause dust accumulation and/or malfunctions

Static electricity is useful in our life and industries, as applied on the core parts of a photocopier or an air purifier, as well as on coating of a car body. On the other hand, static electricity can cause many troubles. In the electronics industry in particular, it can attract dust and cause malfunction of an integrated circuit, memory corruption, and other troubles, which may considerably affect product quality and yield. Manufacturers take a series of measures to prevent troubles associated with static electricity.

Discharge static electricity by adding conductivity

Static electricity occurs when surfaces of two materials are electrically charged through contact or friction. It is discharged through an object that easily conducts electricity, while it can be accumulated on the surface of an insulating object with low conductivity, for example hair, fiber, paper or plastic. Accumulated static electricity attracts dust and dirt on the surface, which poses a hazard to product quality. When either positive or negative static electricity builds up, it attracts an object with an opposite charge.

In manufacturing sites, therefore, they take



Application on a tray for transporting semiconductors

measures to prevent electrostatic charge. Those measures may include neutralization of electric charge by using a neutralizing device installed in a factory, or discharge of static electricity by increasing material conductivity.

The latter method to increase conductivity involves use of a conductive material or an antistatic agent. These products are either applied on the surface or mixed into a material, for the purpose of removing static electricity by leveraging conductivity of these products used as a coating or an additive. Another way to discharge static electricity is to apply a surfactant having a hydrophilic group or an antistatic polymer on a surface in order to leverage moisture in the air.

Sophisticated antistatic measures used in the electronics industry

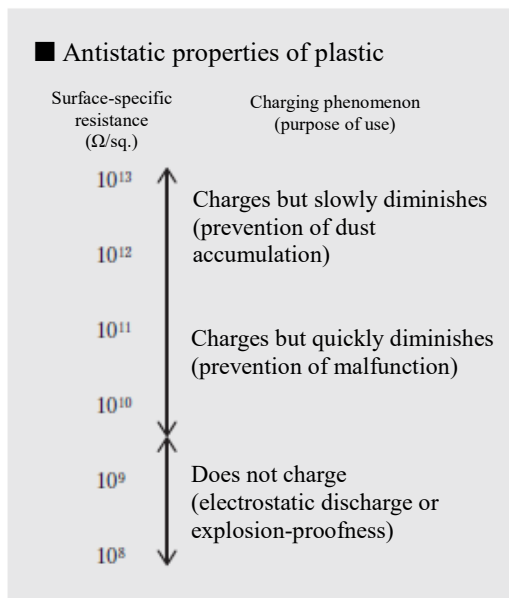
In the electronics industry manufacturing semiconductors and electronic parts, sophisticated management is required because minute dust and electrostatic discharge can considerably affect product quality. Therefore, in a clean room where semiconductors or electronic parts are manufactured, plastic tools including trays and bags are treated with a conductive material such as carbon black or an antistatic agent, to prevent static electricity that can cause accumulation of minute dust and malfunction.

In transfer of semiconductors and electronic parts, care must be taken not only to avoid dust accumulation and malfunction, but to prolong the antistatic action and prevent negative impacts of a conductive material. Conventionally used carbon black may pose certain problems, such as potential stains caused by its fall and incompatibility with a bright color.

Free from those problems, Sanyo Chemical's permanent antistatic "Pelestat" and "Pelectron" Lines are suitable as antistatic agents for transport containers,

sheets, and films in particular, but also other items, that are used to carry and wrapping semiconductors and electronic parts that must be kept clean.

Sanyo Chemical's portfolio meets demands of many industries



Our “Pelestat” and “Pelectron” Lines offer permanent antistatic polymers, to be mixed into plastic materials to maintain antistatic properties semipermanently, by forming conductive circuits inside resin. The both lines have been designed to effectively form thread-like conductive circuits, without compromising resin’s physical properties such as tensile strength almost all, and deliver antistatic performance by lowering surface-specific resistance. The “Pelectron” Line offers low resistance, and these two lines are used for different purposes, such as prevention of dust or static buildup.

In the future, those products are expected to be used for diverse applications, for example tiny and high-density electronic devices, electronic parts, and medical devices. We provide a broad portfolio including not only polymers but also low molecular antistatic agents, which are applicable for different fields and purposes.

■ Surface-specific resistance standards and application examples

Surface-specific resistance (Ω/sq.)	10 ⁸ - 10 ⁹	10 ¹⁰ - 10 ¹²	10 ¹² - 10 ¹³
Application examples	Car interior, home electrical appliances, or construction materials	Office equipment, electronics packaging, integrated circuit tray, or protective film	Inner bag of a flexible container, insulating mat, or medical parts

■ Sanyo Chemical's major permanent antistatic polymers

Item	Pelestat 300	Pelestat 230	Pelestat NC6321	Pelestat NC7530	Pelestat 6500	Pelectron PVL
Fusion point (C°)	Approximately 135	Approximately 163	Approximately 203	Approximately 176	Approximately 191	Approximately 135
Surface-specific resistance (Ω/sq.) (23°C, 50% R.H.)	1×10 ⁸	5×10 ⁷	1×10 ⁹	2×10 ⁹	8×10 ⁷	3×10 ⁶
Recommended molding method	Injection molding	Extrusion molding	Injection molding Extrusion molding	Injection molding Extrusion molding	Injection molding Extrusion molding	Injection molding Extrusion molding
Recommended resin	PP/PE, etc.	PP, PE, HIPS etc.	ABS, PC/ABS, PBT, etc.	MS, transparent ABS, etc.	ABS, PC/ABS, PBT, etc.	PP, PE, HIPS, etc.

ABS: acrylonitrile butadiene styrene; PC = polycarbonate; MS = acrylic styrene; PP = polypropylene; PE = polyethylene; HIPS = high impact polystyrene; PBT = polybutylene terephthalate

Please contact our sales office for an order. Make sure to read “Safety Data Sheet” (SDS) before use. Please note that users are responsible for assuring suitability and safety in their application of use.