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unitech's ESD-Safe Scanner

WHY (Reason to Build This Technology)

Electrostatic discharge (ESD) impacts productivity and product reliability in virtually every aspect of electronic environment. Despite the effort made over the past decade, ESD still costs the electronics industry billions of dollars every year. Industry experts attribute an estimated 8 to 33% of all product losses to be caused by ESD.1 The individual cost of these devices themselves range from a few cents for a simple diode to several hundred dollars for complex hybrids. However, ESD damage affects more than just the loss of devices. It affects production yields, manufacturing costs, product quality and reliability, customer relationships, and ultimately, profitability.

unitech's ESD-safe scanner can prevent ESD damage to your product when you need to scan barcode in your ESD Protected Areas (EPA).

HOW (Concept of This Technology)

There are two ways to give the plastic surface become conductive for ESD-scanner :

- External Addition : This method is to apply the antistatic agent [Note 1] to the surface of the product by brushing, spraying or dipping.
- Internal Mixed : The method is to add the antistatic agent to the material at the time of the ingredients to be uniformly dispersed throughout the polymer.

The Internal mixed way can provide longer time of ESD protection than external addition way due to external additional anti-static in the latter part of the packaging or processing process was wiped away. Internal mixed antistatic agent can continue to add antistatic agent to the plastic surface, to make up the surface due to wipe and the amount of antistatic agent consumed.

Note 1: An antistatic agent is a compound used for treatment of materials or their surfaces in order to reduce or eliminate buildup of static electricity. Static charge may be generated by the triboelectric effect[1] or by a non-contact process using a high voltage power source. Static charge may be introduced on a surface as part of an in-mold label printing process.[2]

The role of an antistatic agent is to make the surface or the material itself slightly conductive, either by being conductive itself, or by absorbing moisture from the air; therefore, some humectants can be used. The molecules of an antistatic agent often have both hydrophilic and hydrophobic areas, similar to those of a surfactant; the hydrophobic side interacts with the surface of the material, while the hydrophilic side interacts with the air moisture and binds the water molecules.

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WHAT (Case Study Benefits)

unitech's MS84X ESD-safe scanner is made by internal mixed way with antistatic agent to protect MS84X series to be ESD safe to be used at ESD protected area including its cable. The body of the product and its cable can withstand ESD up to 10^9 ~10^{10} ohms per square and no containing of Chlorine material. Remark: The requirement at Semi-conductor manufacturer, like TSCM and Samsung is 10^5 to 10^{10} ohms.

Target market for MS84X ESD-Safe scanner Semi-conductor manufacturers

- Semi-conductor manufacturers
- Gas stations
- Fueling ground
- Mining field
- Hospital
- Any area which gas, fuel vapour and coal dust explosions should be concerned to happen.
- Any concern about the failure of solid state electronics components such as integrated circuits, such as Semi-conductor manufacturers, PC motherboard assembly factory, SMT service company, Service and repair bench for electronics devices, like smartphone.

MS84X ESD tested by surface resistance meter :

Test report issused by Taiwan Plastic Industrary development Center

財團法人 塑膠工業技術發展中心
Plastics Industry Development Center

Polymer Materials Testing Laboratory
Analysis/Test Report

Application No : 105A011-J310023R1
Date Tested : 2016/01/08

Item(s)/ Method(s)		Result(s)	Note
1. Surface Resistivity ASTM D257		Surface Resistivity (Ω)	
	#1	4.07×10^{10}	
	#2	4.10×10^{10}	
	#3	3.68×10^{10}	
	#4	3.87×10^{10}	
	#5	3.04×10^{10}	
	Mean	3.75×10^{10}	

REMARK :
1. Surface Resistivity
   1.1 Specimen Preparation Method: Cutting-Molding after Injection
   1.2 Conditioning of Specimen: 23 ℃ ± 2 ℃, 50 % ± 5 % Relative Humidity, over 40 h
   1.3 Conditioning of Experimental: 23 ℃ ± 2 ℃, 50 % ± 5 % Relative Humidity
   1.4 Specimen Mean Thickness: 2.10 mm
   1.5 Test Voltage: 500 V
   1.6 Test Time: 60 sec

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