ANTISTAT™
ESD & PRODUCTION CONSUMABLES

INTEGRITY™
CLEANROOM PRODUCTION SOLUTIONS

Learning about Electrostatic Discharge - Part 2:

Setting up a Typical EPA

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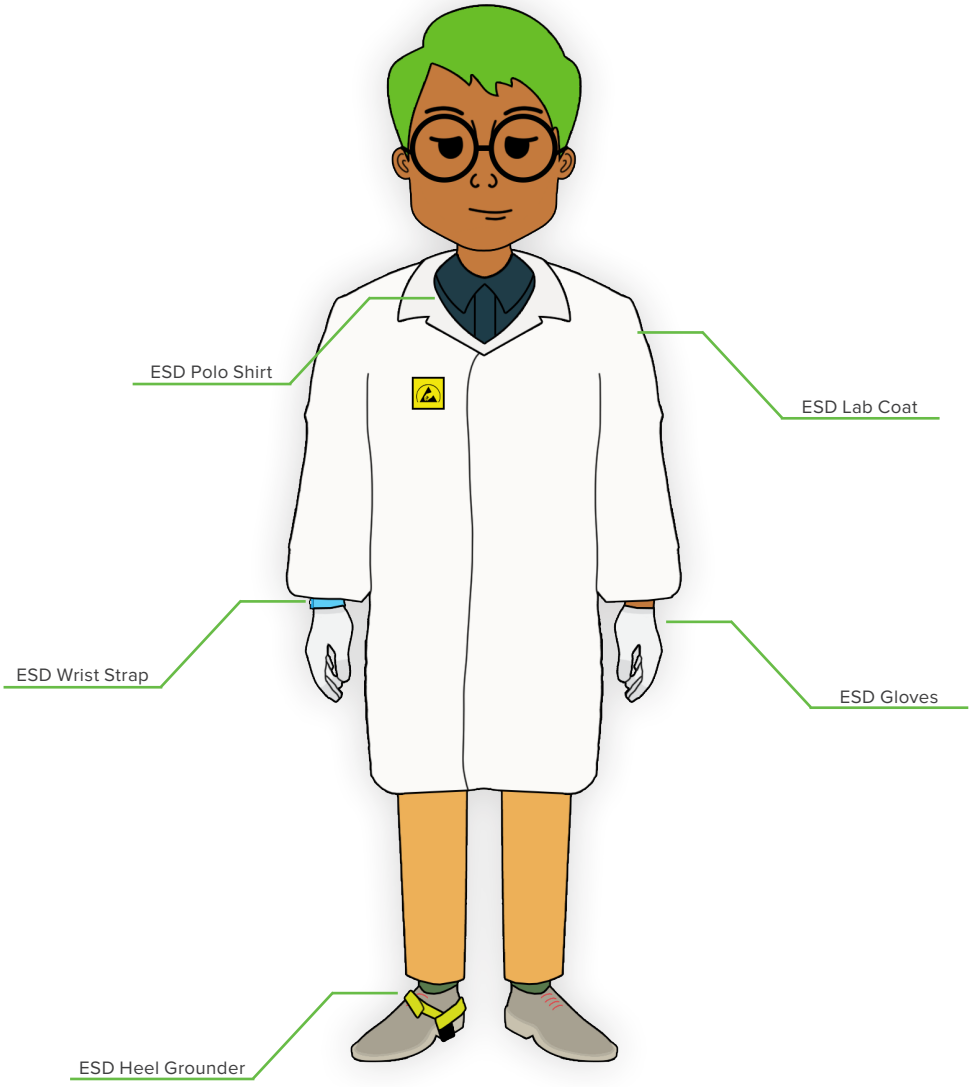
Gowning in your EPA

Personal grounding

Before you enter your EPA, it is important you are wearing the correct garments and that you are fully kitted out for the area you are about to work in.

Below you can see a worker about to enter an EPA. Before we go into each piece of clothing, the first step is to understand what you should or can wear, depending on your EPA's requirements.



***Note** - While the subject in this photo is wearing both wrist strap and heel grounder, this is purely to illustrate all personal grounding possibilities. A wrist strap and heel grounder would **not** be worn at the same time within a typical EPA area.*

ESD clothing

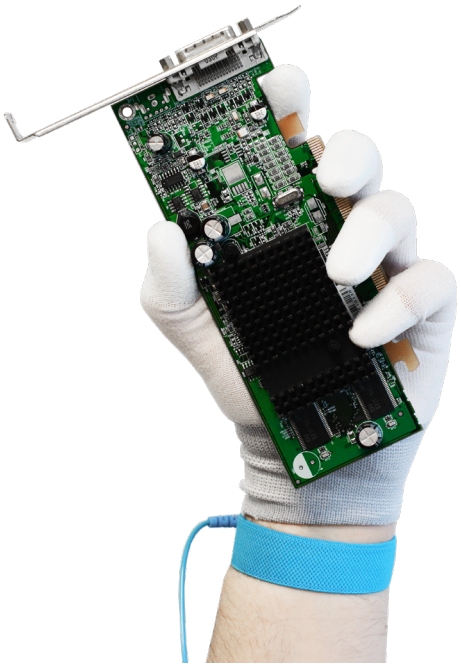
ESD clothing is essential within your EPA as it helps to control and dissipate static charges, reducing the likelihood of damaging electronic components or causing sparks that could ignite flammable materials.

ESD clothing is specifically designed to prevent or minimise the generation and accumulation of static electricity on a person's body. It is typically made from materials that have low electrical resistance, allowing static charges to dissipate more effectively.

Our range of ESD lab coats, polo shirts, jackets, fleeces and trousers meet the EN 1149-1:2006 standard and are designed to be worn as part of a comprehensive ESD control program.

ESD gloves

Antistatic and conductive gloves help to prevent damage to ESD sensitive items when the user is grounded. They also provide protection against dust and particle contamination.



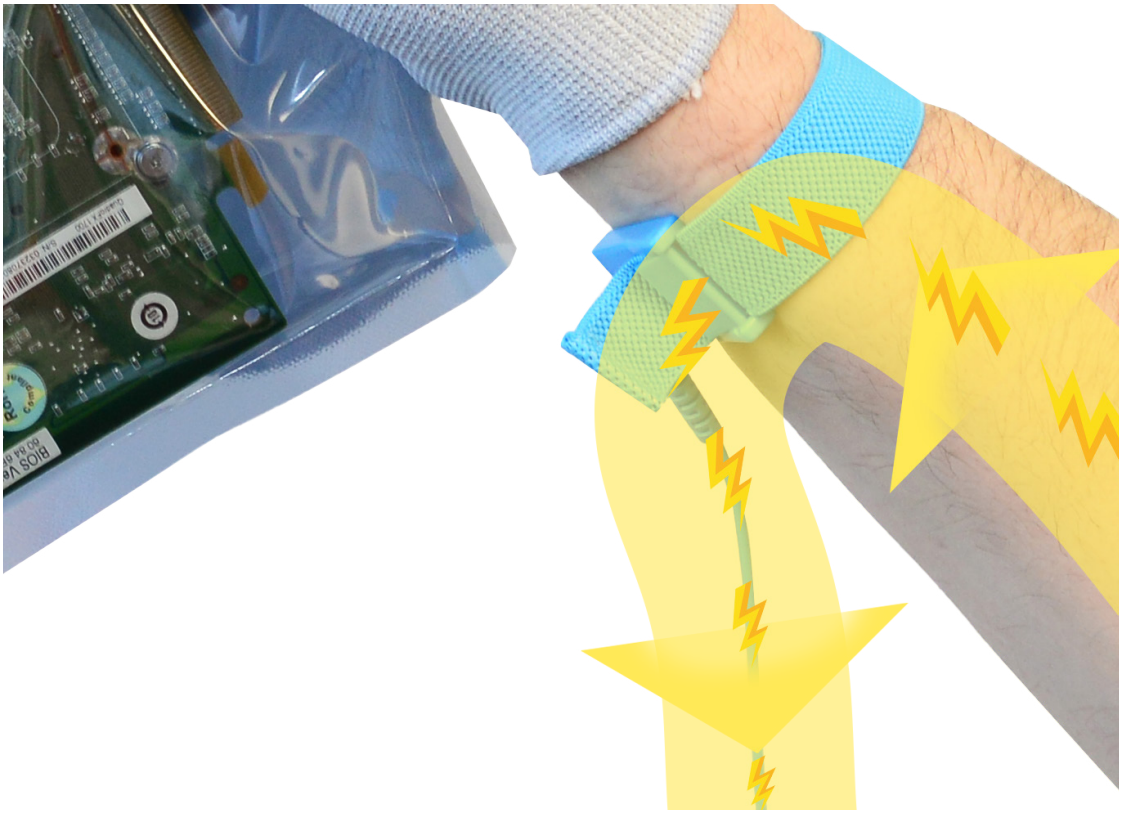
ESD gloves are available in a wide range of styles, sizes and materials. Each glove is used for different purposes so it is important to know which glove is best for your EPA.*

*For more information on gloves, please check out Part 3 of our guides
Part 3 - Choosing the Right ESD Glove

ESD wrist straps

Antistatic wrist straps are designed to safely ground operators working with ESD sensitive components when personnel are seated. The wrist strap is connected via a lead to a grounding source such as a grounding plug. This creates a pathway for any built up static charge on your body to safely discharge, preventing potential damage to electronic components.

Many industries, such as electronics manufacturing, assembly, repair, and laboratory work, have strict guidelines and standards for handling electronic components. Using antistatic measures, including wrist straps, is often a requirement in these environments to ensure product quality and reliability.



Whilst Wrist Straps are highly effective, one thing people regularly miss is keeping the wrist strap close to the skin establishing a path to ground. If you don't do this, the wrist strap becomes redundant.

If you require more mobility within your EPA you should wear a sole, toe or heel grounder instead of wearing a wrist strap.

ESD foot grounders

Heel, sole and toe grounders provide a variety of ways to protect the user from ESD within the EPA. Just like wrist straps, foot grounders discharge static to the ground. A ribbon, connected to the grounder, is slotted into the user's sock or shoe, creating a connection to the user's skin through perspiration. The charge travels through the ribbon, through the grounder and into the floor.

There are three different styles of grounder depending on the style of shoe worn.

1. Heel grounders

Should be applied to regular shoes, heel grounders are the most effective comfortable fit for this kind of shoe.

2. Toe grounders

Should be applied to shoes where a heel is too big or awkward to use a heel grounder, such as a high heel.

3. Sole grounders

Has a larger surface area so would be used in an environment where extra protection may be required.

For a grounder to be most effective, ESD protected flooring is required, otherwise an additional charge from untreated flooring, such as carpet, can negate the effects of the grounder.

On the next page you can see how to equip an adjustable heel grounder. Adjustable toe and sole grounders should be put on in the same manner, however, non-adjustable grounders can be placed on as is.

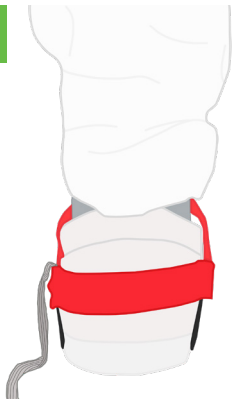
The most important point to remember to remember is to place the ribbon ensuring it touches the skin. Without this, the grounder cannot work.

A guide to using heel grounders

1

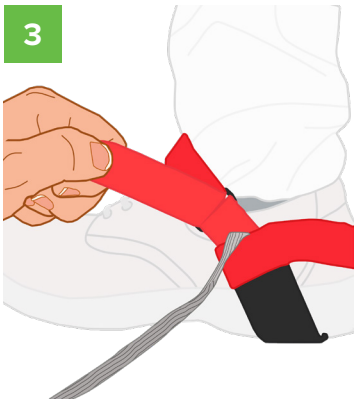
Remove heel grounder from its packaging and place the conductive rubber strip on the heel grip of the shoe.

2



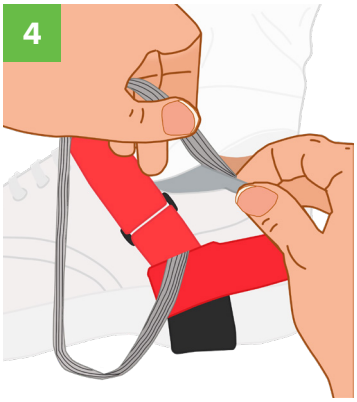
Place the coloured elastic strip at the back of the shoe.

3



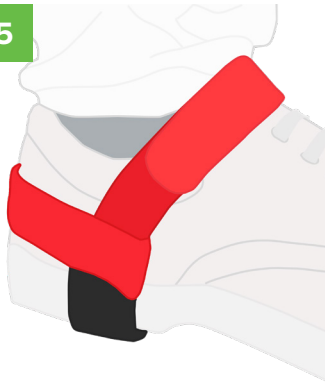
Feed the hook and loop fastening through the plastic buckle, pull tight and press down to hold the strap in place.

4



Feed the conductive ribbon into the sock or shoe to complete the grounding path.

5



Inspect the heel grounder for a secure and comfortable fit by gently tugging on the straps.

6

The footwear is now ready to be tested before entering a static sensitive area. Repeat with other shoe.

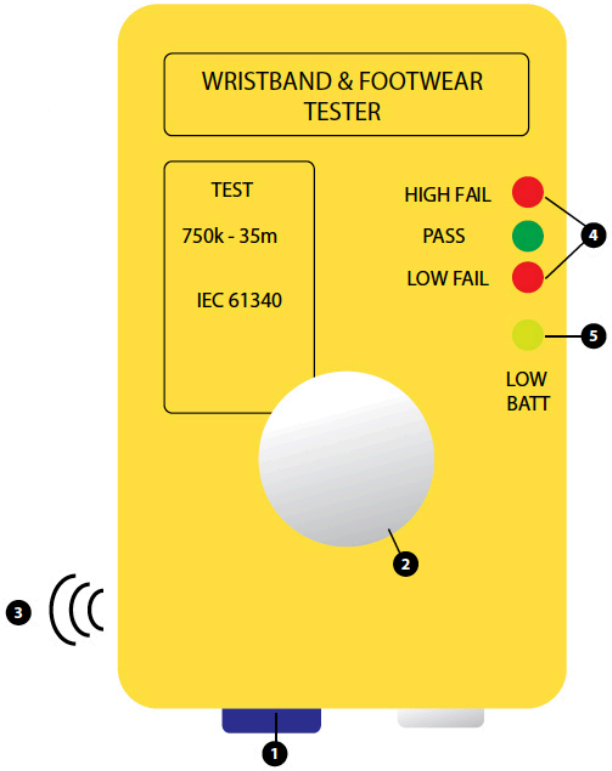
To download a PDF of the guide above which you can print off and use within your EPA, please scan the QR code to the left.

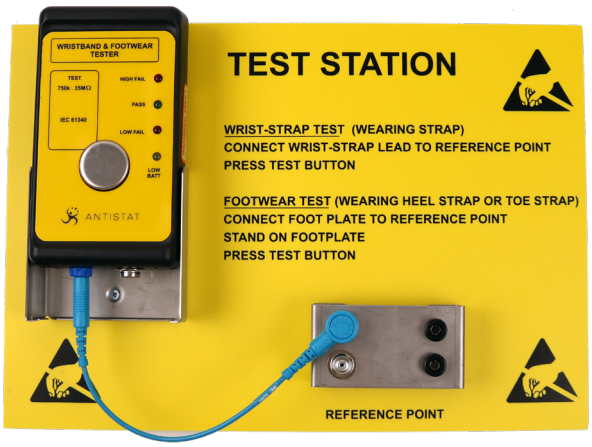
Personal equipment testing

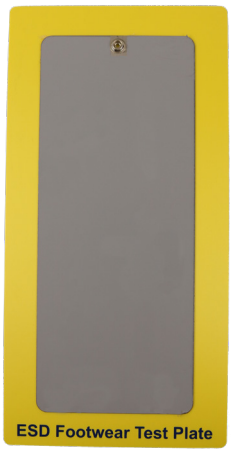
Once you have donned your grounding equipment, you must test it. This can be done by using a Test Station Kit.

These testers are designed to measure both high and low fail and pass functions. At Antistat we sell our own tester which includes a wall mount and a footplate. Below is how it works:

1. When testing, the operator simply connects to the testing kit via the 4mm banana plug socket.
2. To test, make finger contact with the stainless steel push button, and “press to test”. A green LED will illuminate for pass or the red LED will illuminate for fail.
3. An audible buzzer will sound if the red fail LED illuminates.
4. If the resistance through the coil cord wrist strap and person exceeds 35 meg ohms the red fail LED will light, if the resistance is below 7500 kilohms the red fail LED will light.
5. If the 9 volt PP3 battery falls below 6.5 volts during test, the yellow battery low LED will light up.





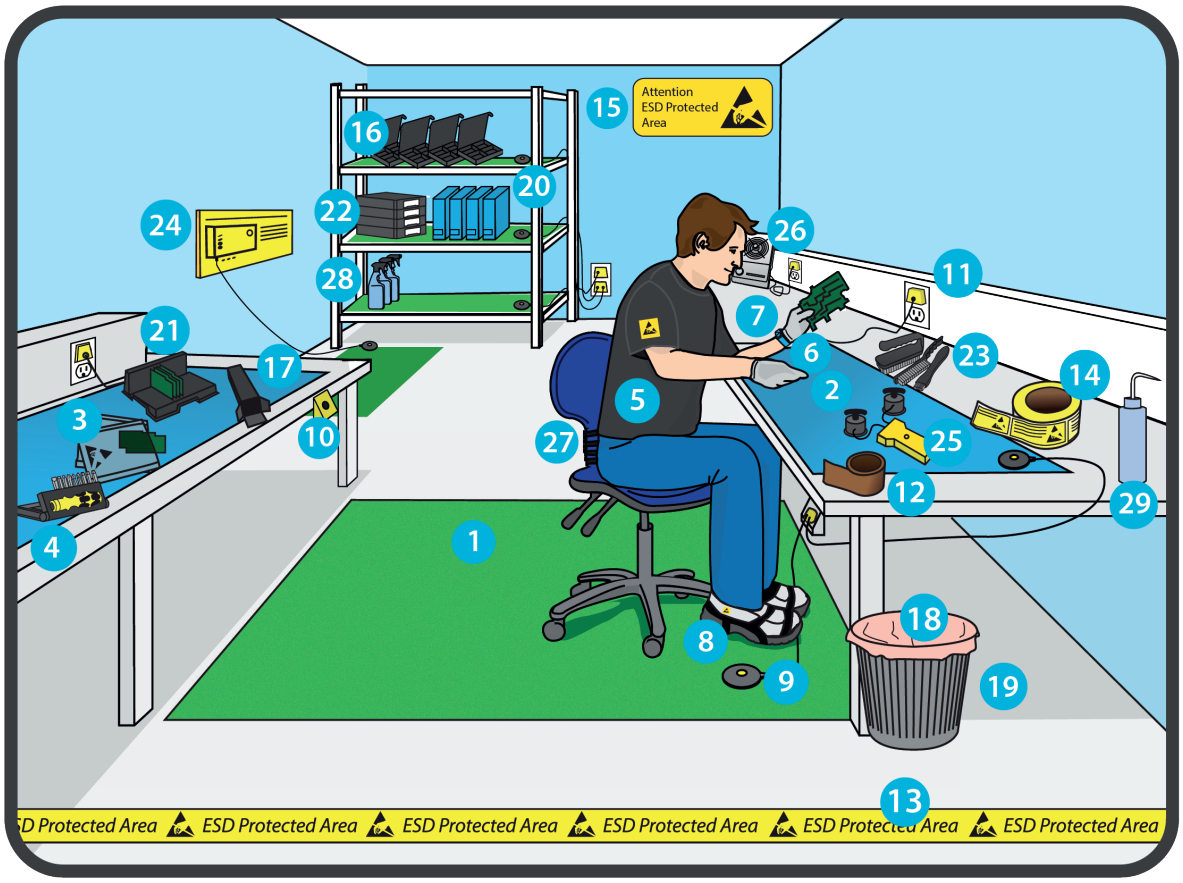


Equipping your EPA

Sample of an EPA workstation

Setting up your EPA correctly is critical. The diagram below illustrates everything you need for an effective EPA.

1. ESD Matting
2. ESD Bench Matting
3. ESD Bags
4. ESD Screwdrivers
5. Antistatic Clothing
6. ESD Gloves
7. ESD Wrist Strap
8. ESD Foot Grounder
9. Grounding Cords
10. Earth Bonding Points
11. Earth Bonding Plugs
12. Antistatic Tapes
13. Floor Marking Tape
14. ESD Labels
15. EPA Signage
16. Corstat Transit Packs
17. Corstat Component Boxes
18. ESD Bin Liners
19. Conductive Waste Bin
20. Antistatic Ring-binders
21. Conductive PCB Rack
22. Conductive Tote Bins
23. Conductive Brushes
24. Wrist Strap & Footwear Tester
25. Testing Equipment
26. Ionising Blower
27. EPA Chair
28. IC Workstation & Mat Cleaner
29. ESD Wash Bottle



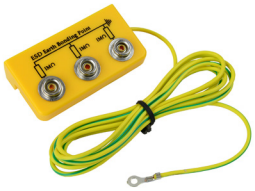
Setting up equipment within the EPA

Ensuring all equipment is set up effectively is essential. Here are 4 things to remember:

1. Grounding points

Make sure you have grounding points set up within your EPA, ensuring you use the most suitable for your set up. The different plugs and points available are:

- **Earth Bonding Plug** - the standard available in different styles, connect your lead straight here for straightforward grounding
- **Under Bench Bonding Bracket** - connected to the bench for easy access to workers.
- **Earth Bonding Point** - designed for use where main earth may not be suitable or may be inaccessible.
- **ESD Bonding Point** - this single ESD Bonding Point provides a grounded fixture to which EPA equipment may be connected or 'bonded'.



2. Get grounded

Ensure all equipment is grounded: plugging them in via leads, cords and points.
The items that need to be grounded/plugged in are:

- **Wrist Straps** - this is done by connecting your wrist strap to a plug using a coiled earth lead. A coiled lead is needed to allow the cord to be stretched to avoid breaking.
- **Bench/Floor Mats** - bench Mats and Floor Mats should be grounded via a straight earth lead. Preferably, the best lead to use is one with a conical head as it ensures the grounding stud remains protected, reducing the likelihood of disconnection.

Contd.

3. Additional equipment

Ensure all your equipment is considered as part of your controlled environment. Stationery, for example, are the most overlooked items within an EPA but can produce a static charge. Clipboards, tape, pens etc. need to be replaced with ESD-safe stationery in order to maintain the integrity of your EPA.

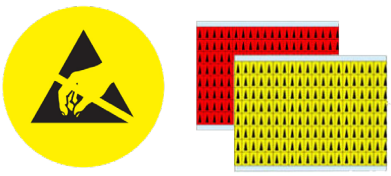
4.Storage

ESD-safe storage is crucial to prevent electrostatic discharge events and maintain the integrity of components. ESD storage bins and PCB Rack's made from conductive or dissipative materials are a great example of keeping items safely stored within the EPA and can be used for temporary or permanent storage. Keeping components organised and separate reduces the risk of ESD events.

EPA signage

Available in both rigid and self-adhesive styles, making sure your EPA is clearly signed ensures a good understanding of protocols within and around your EPA.

Labels are highly effective for identifying ESD sensitive items enclosed within packaging further down the manufacturing process. See examples below:



Surface equipment testing

To maintain your EPA, it is important to test the surfaces you are working on to make sure they are properly grounded.

Surface Resistance Meters are ideal for accurately testing surface resistivity for ESD control applications to meet the latest industry standards such as ANSI/ESD S20.20 or IEC 613340-5-1/2. They are designed to measure point-to-point, the surface resistivity of plastic, polymers, large sheets of plastic or clothing materials. Surface resistance is typically measured in ohms and will help to classify materials and determine their suitability for use within your EPA.

Testing and auditing all elements within the EPA is essential to comply with industry standards. At Antistat we sell our own testers; a 9V version and a 10V/100V version. Lower voltage meters are more affordable but can only be used for smaller areas. Higher voltage meters, while more expensive, allow users to test larger areas with more accuracy such as floors.

Periodic audits and verifications of surface equipment testing should be carried out to ensure that ESD control measures remain effective over time.

Storage within the EPA

Which storage is which?

Proper storage practices are an integral part of maintaining an EPA and should be consistent with the overall ESD control plan and industry standards. Here are some considerations for ESD-safe storage within an EPA:

Storage Bins

ESD-safe storage bins provide a versatile and economical method for the storage and handling of electronic components, tools and materials. Easily integrated into all shelving systems, their standard sizes mean that they can be used in any combination within shelf units, independent of the application. Most also have integrated fixings on the rear to allow them to be used with louvre wall panels giving extra flexibility.

Antistatic Waste Bins

Conductive waste bins, when used in conjunction with antistatic bin liners, provide a comprehensive ESD safe solution to waste disposal. Using antistatic bin liners with these bins ensure no charge is generated. Placed on an ESD floor or ESD floor mat, these bins will ensure that the ESD path to ground is maintained.

Reel Storage System

Reel storage systems provide robust ESD-safe bench mounted storage for components reels.

ESD Pallets

Although ESD pallets have an especially low empty weight, they are incredibly durable with an impressive load-bearing capacity and can therefore be used for worldwide exports.

SMT Magazine Rack

SMT magazine racks are designed for the manufacture, assembly, storage and transfer of PCB's. This product is made out of metal and can store up to 50 PCB's.

Moving Packaging out of the EPA

Keeping you equipment safely contained

ESD packaging plays a crucial role in protecting sensitive electronic components during storage, transportation and handling. Select packaging materials based on the level of ESD protection required as different components may have varying sensitivity levels to ESD.

Bags

Firstly, when placing products in bags, it is important to make sure you are using the correct bags with the right properties.*

Conductive Packaging

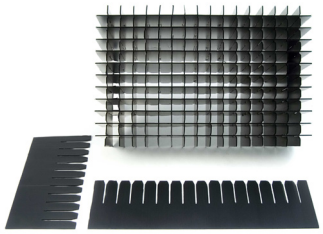
Antistat's range of Corstat conductive packaging, is a great way to move bulk products out of your EPA in a simple effective manner. They provide a conductive path for static charges to dissipate providing excellent, cost-effective ESD protection.
The range includes:

Collapsible Tote

Collapsible Totes offer a perfect solution where space is an issue for storage or cost-effective return shipping. Manufactured from conductive corriplast, the collapsible tote is lightweight, robust and ESD safe method of storage.

Tote Divisions

Tote Divisions can be arranged to create a network of cells suitable for your particular application, designed to fit the collapsible totes.



Component Boxes

The Corstat range of component boxes offer a convenient and safe way to store and transport static sensitive devices. The Corstat conductive coating provides Faraday cage protection and the (optional) antistatic foam insert provides ESD safe cushioning to protect the box contents.

*For more information on bags, please check out Part 5 of our guides
Part 5 - Choosing the Right ESD Bag

Inplant Handlers

These conductive fibreboard Corstat inplant handlers provide a flexible, fully adjustable, anti static system to safely house boards. With adjustable partitions you can easily create the desired cell size to accommodate nearly any board size.

Bin Boxes

Bin boxes are available in a wide range of standard sizes with the option of closed, open front, and fully open variants. Allowing quicker & easier identification of items & streamlines stock retrieval processes.

For all our ESD products, scan the QR code to the left.
We supply a wide variety of products from bags to matting to stationery to labels.

ANTISTAT™ ESD & PRODUCTION CONSUMABLES

INTEGRITY™ CLEANROOM PRODUCTION SOLUTIONS

ISO 9001 QUALITY ASSURED

We are focused on meeting our customer's expectations and delivering exceptional customer satisfaction.

CUSTOMER FOCUSED APPROACH

With over 35 years' experience, our service culture is the very core of our customer's success.

STANDARD OF EXCELLENCE

From beginning to end our team of knowledgeable experts are here to help.

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