

ESD OPTIONS

**ESD (Electro-Static Discharge)
The sudden transfer of free electrons
from a positively charged object to a
negatively charged object.**

ESD events occur far more frequently than we realize, and many ESD events go unnoticed. Approximately 90% of all ESD events are generated by the human body, but in order for the human body to feel static electricity, the discharge must reach at least 3,500 volts.

Something as simple as the movement of the technician at the workbench, however, can generate as many as 6,000 volts of static. And costly damage to some electronic devices can occur with as little as 15 volts of static. The unknown nature of ESD translates to an invisible danger in the form of product failures, quality problems and unscheduled downtime.

As electronic devices have become increasingly sophisticated and smaller, they have also become increasingly susceptible to damage from ESD events. By controlling ESD at the workbench, these failures can be minimized.

ESD Control requirements vary with the “static threshold” of the various ESD susceptible devices employed.

When planning a program to minimize ESD Control problems, determine the maximum ESD sensitivity level that will be encountered in the foreseeable future.

With this information as a basis for planning, the appropriate ESD Control device can be selected.

A number of factors in the work area — relative humidity, ionization, type of clothing, workbench design — can contribute to the ESD Control problem and they must be considered in a well-planned ESD Control program.

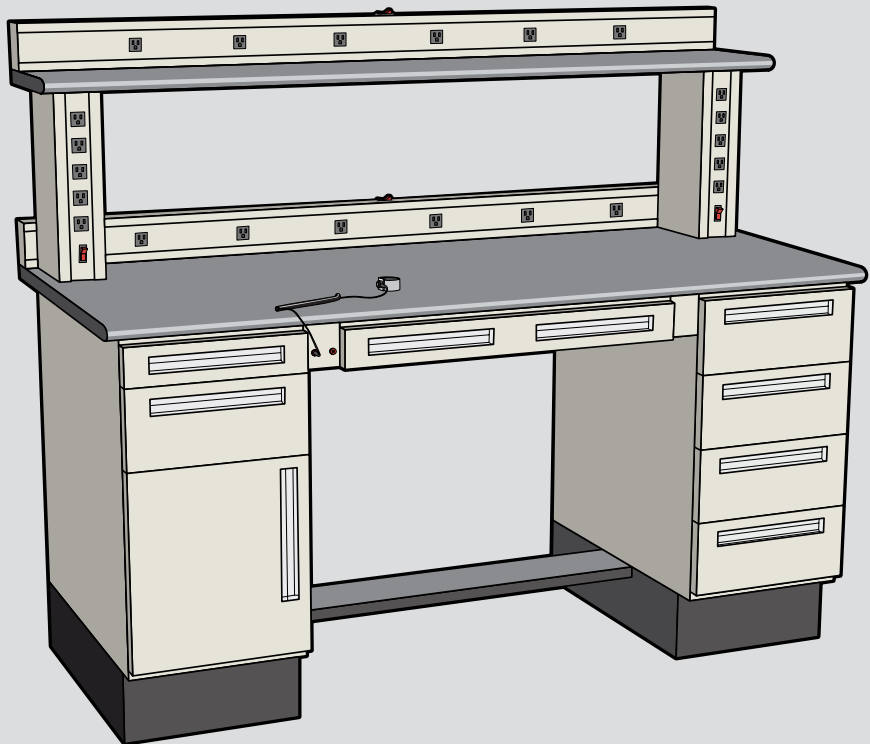
A Teclab Static Control Bench is a primary component of any established ESD Control program.

The Teclab ESD Control workbenches shown here are standard Teclab workbenches with modifications and additional components that are ESD Control specific.

They are identified by the addition of a suffix to the standard bench part number.

For example, this bench is a standard TWS-1020 with the added suffix ESD-1, or TWS-1020-ESD-1.

Any Teclab workbench can be specified in this manner.



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Multi-Level ESD Control

Bench Part # Suffix	ESD-0	ESD-1	ESD-2	ESD-3
ESD Control Level	Class 0	Class 1	Class 2	Class 3
Equipment:				
ESD Wrist Strap	✓ -CM	✓	✓	✓
ESD Work Surface	✓	✓	✓	
ESD SS/PBG Isolators	✓	✓	✓	
Common Point Ground	✓ -CM	✓	✓	
Countertop Ground	✓	✓	✓	
ESD Ground Jacks	✓	✓	✓	
ESD Shelf	✓	✓		
Grounded Cabinets	✓	✓		
ESD Drawer Mats	✓	✓		
ESD Floor Mat	✓			
ESD Constant Ground Monitor (CM)	✓			
ESD Bench Mat				✓
ESD Bench Mat - Dual Ground Jack				✓
ESD Seating	optional			
ESD Flooring	optional			
ESD Clothing	optional			

The above chart represents four levels of ESD Control at the bench. Each level is shown as a "Class" on the chart. These four different classes protect different areas of the work bench.

The basic level 2, or ESD-2, protects the worker and the work surface. ESD-1 keeps the ESD-2 items and adds protection for the upper shelf and the drawers as well as trays in the cabinets.

For our most complete level of protection, ESD-0 adds an ESD floor mat and a Constant Ground Monitor to keep the worker aware of any ESD problems.

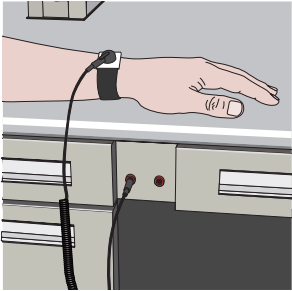


Each level or bench class includes the ESD specific equipment as indicated by the chart. All listed ESD equipment components have been carefully selected and engineered into each individual bench configuration to provide the same potential to ground; minimizing the opportunity for an ESD event to occur. As the static sensitivity level of devices that will be handled at the bench increases, more care must be taken to preclude an ESD event.

Therefore, a Class "0" ESD Control workbench utilizes the maximum number of grounded components — all with the same potential to ground, even including a "Constant Ground Monitor."

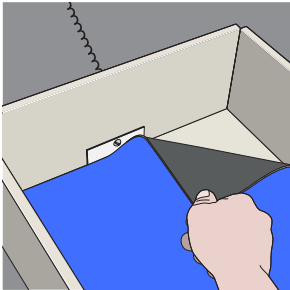
As the likelihood of destructive ESD events decreases, a less elaborate approach can be effective. See chart.

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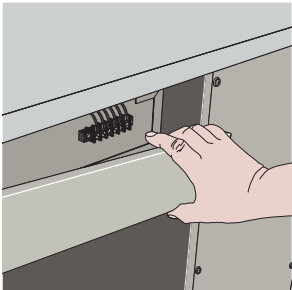
Human handling is responsible for approximately 90% of all ESD damage, so use of a **ESD Wrist Strap** is essential. The ESD Wrist Strap features a conductive thread interwoven on the breathable elastic band that provides 360° of skin contact.

Comes complete with a 6 ft. coiled foil conductor cord with built-in 1MΩ resistor.



An integral component of a Teclab ESD work station is the **Grounded Cabinet**. Each drawer has a coiled Ground Wire connected to a Ground Bracket installed on the cabinet shell to dissipate static. The cabinet is then connected to the Common Point Ground System.

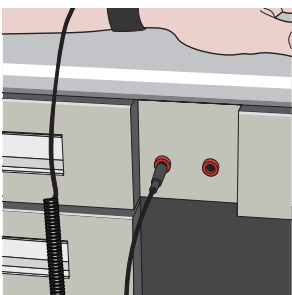
This **ESD Drawer Mat** provides a surface resistivity of $10^9 \Omega/\text{sq}$. ESD susceptible items stored in the drawers of base cabinets require the same static control protection as those at the work surface. The pliable 1/8th inch mat comes in blue and fits snugly inside every Teclab drawer.



The **ESD Multi-Point Common Point Ground System** brings all ESD components to the same potential to ground.

All components are linked to a common grounding point, generally located at the rear of the workbench.

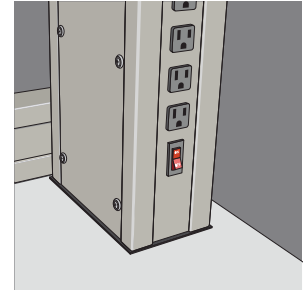
This grounding point can range from a single grounding bolt to a multi-connection terminal block.



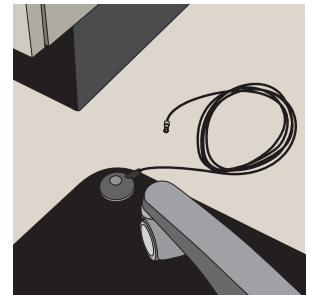
ESD Ground Jacks can be located in Aprons, Apron Fillers (shown here), Shelf Supports or to your specifications.

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Teclab ESD Work Benches are designed utilizing **Isolated ESD Components** for added protection and minimizing ESD occurrences. Components equipped with electrical power, like Shelf Supports and Powered Back Guards, are isolated from the dissipative element of the work surface, and the entire workbench ESD Control System by way of a non-conductive barrier, assuring the integrity of the Teclab Common Point Ground System.



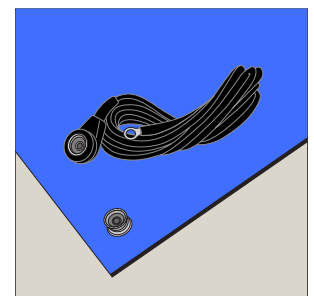
This pliable 3' x 4' **ESD Floor Mat** provides the static protection necessary where a dissipative floor is required, but not available. Resistance to Ground is $3.8 \times 10^9 - 1.3 \times 10^{10} \Omega$ per ANSI EOS/ESD-S4.1 @ 10 volts. The mat comes in black and is compatible with various floor surfaces including carpeting and hard floor coverings.



ESD-CM-2648-P **Constant Ground Monitor**: For Class "0" ESD control, continuous monitoring of work surface ground and personnel ground are recommended. Monitoring systems and static charge meters are available. Please contact your application engineer for further details and pricing.



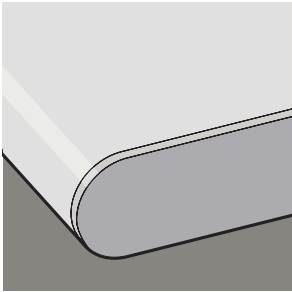
ESD-DBM-4824 **ESD Bench Mat**: (48" x 24") When a portable work surface is required, this flexible vinyl bench mat will provide a surface resistivity of $<109 \Omega/\text{sq}$. $\frac{1}{8}$ " thick x 48" x 24". 15' grounding cord. Comes in blue.



ESD Chairs are equipped with features to ensure your sensitive items are protected from Electro-Static Discharge.



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ESD Work Surfaces

Teclab **ESD Work Surfaces** and Riser Shelves are available in several standard sizes and an unlimited number of custom sizes using ESD laminates. We offer 4 colors to choose from to match your work space.

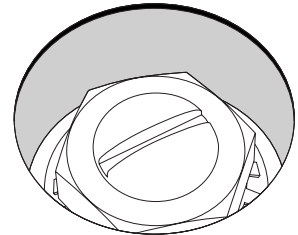
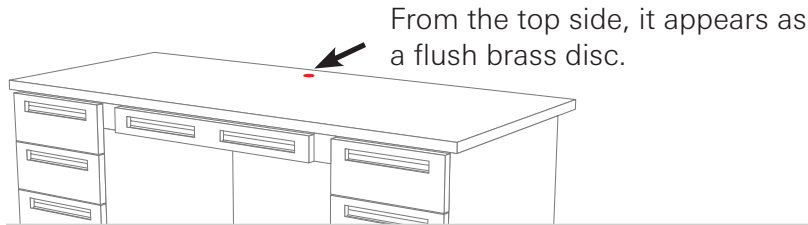
A 180° roll on the front edge ensures continuous conductivity along the front edge of the work surface.

These countertops provide a colorful, durable, and reliable work surface with the recommended surface resistivity of 1×10^6 to $1 \times 10^9 \Omega$



ESD Ground Bolt

All **ESD work surfaces** and **ESD shelves** have an ESD ground bolt near the center back of the surface. Longer countertops and shelves may have two ground bolts.



Underside of Ground Bolt

ESD WORK SURFACE TECHNICAL DATA

ESD Properties as per IEC 61340 & ESD S-4.1, S-20.20		
Test Condition	Temp.- 25°C	
	Humidity- 45%	
Instrument Used	MEGGER METER	
Surface Resistance (Max.)	Preferred Value	Observed Value
	< 1.0×10^9 Ohm	< 5×10^8 Ohm
Point to Point Resistance (Max.)	< 1.0×10^8 Ohm	< 5×10^7 Ohm
Surface to Ground Resistance (Max.)	< 1.0×10^9 Ohm	< 2×10^8 Ohm
Decay Time (As par NFPA 99-MIL-STD-3010)	< 0.5 sec	< 0.02 sec