Wrist Straps
Grounding, Testing and Maintenance
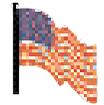
Made in America

Location of Proper Ground Point

Wrist straps, work surfaces and floor mats which are to be grounded for protection against electrostatic discharge (ESD) should be grounded to a common point. The common point should be connected to the "green wire" equipment ground.
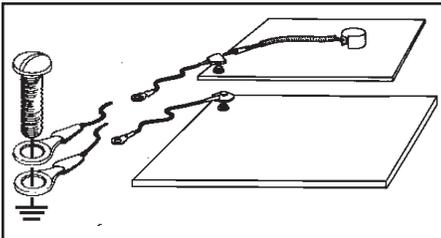

Figure 1. Common point ground for each workstation.

This may be accomplished in a variety of ways utilizing common point ground blocks, ground buses or connecting directly to the nearest utility "green wire" ground point. In a properly wired building the nearest reliable ground point will be the center screw of the standard 110 VAC outlet.


WARNING! DO NOT DAISY CHAIN THE WRIST STRAP.

GREEN WIRE EQUIPMENT GROUND

NO
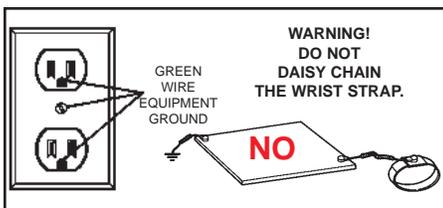
Figure 2. "Green wire" equipment ground.

Each individual workstation must be individually grounded to the ground bus or "green wire" equipment ground. Do not wire work surfaces or other ESD devices in series or "daisy chain" them. This can create unknown resistance and unacceptable grounds.

For a more detailed discussion of ESD grounding or workstation mats see for Tech Brief PS-2022.

Test The Ground Before You Use It And Periodically Thereafter

You should not assume that any AC electrical outlet is properly wired. Even if it was originally wired correctly it can become ungrounded due to corrosion and wear.

Test the ground you intend to use before you hook up. We suggest using ESDSystems.com item 94380 AC Outlet Analyzer and Wrist Strap Tester.

A Banana Jack is Recommended

Almost all wrist strap manufacturers terminate wrist strap ground cords with banana plugs. This is because the banana plug and jack have proven to be a fast and reliable way to attach to ground. If you must use another method such as snaps or alligator clips, due to your particular environment, be sure to test the connections often.

Note: Many wrist strap users clip the wrist cord to the edge of an ESD protective mat. This process is not recommended as it can increase the total system resistance to ground to over the 35 megohm limit recommended in ESD S 20.20. (ESD Handbook TR20.20 section 5.3.2.2.2 Wrist Strap Ground Cord)

13523/ 13525

13160/ 13165
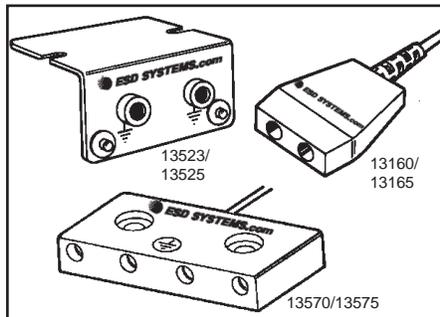
13570/13575

Figure 3. ESD Systems.com 13523/13525 dual bench mount, 13570/13575 quad ground cord, and 13160/13165 common point ground are all easy ways to provide multiple banana jacks at any work station.

Maintenance of the Ground System

You should set up a maintenance schedule to be sure that all ESD grounds are inspected and tested periodically, every six months for example.

Testing the Wrist Strap

The best test of the wrist strap system is while it is worn. This includes all three components: the wrist band, the ground cord (including resistor), and the interface with the wearer's skin.

95402

41222

41193

Figure 4. Wrist strap testers.

ESD Systems.com has several testers available for this purpose. For more information ask for the tech brief for each tester.

If you obtain an open or bad reading from the tester you should stop work and test the wrist band and cord individually to find out which item has failed. Replace the bad component and test the system again. Obtain a "Pass" reading before beginning work.

A bad reading can also result from the wearer's dry skin. Reztore Hand Lotion Item 16009 can be used to enhance the effectiveness of wrist straps for individuals with dry skin. The hand lotion will not adversely affect solderability and the skin moisturizers help eliminate chapped skin.

Cleaning

For proper operation, the wrist strap, especially the wrist band strip, must be kept clean. All wrist bands should be cleaned with a mild detergent on a periodic basis. Be sure that metallic expansion wrist bands are thoroughly dried to prevent corrosion.

Woolite™ works well. Liquid detergents are better than dry in that there is less caking and frictional wear. Launder elastic wrist band strips in cool or warm water, tumble dry with low heat or hang dry. This works well if using a standard house machine on gentle cycle. Industrial machines are fine if "Pony" (typically under 200 pound loads) machines are used. It is not recommended to launder .. in heavy industrial laundry machines as it will lead to premature wear. Should be tumbled dry using low heat. DO NOT BLEACH.

Wrist Strap silver fibers are sensitive to heat and should not be exposed to laundering heat in excess of 120°F. Use only non-ionic softeners and detergents when laundering."

Size Adjustment of Wristbands

Elastic Adjustable Wristbands

With either 4mm or 7mm Snaps
The elastic adjustable band is designed to be adjusted to the proper size to fit each individual wearer. After adjustment it can be used as a fixed size band. It is only necessary to adjust the size once.

1. Place the wristband on the wrist.

2. Open the clasp by pulling upward on the "tail" of material that extends out from the clasp.

3. Tighten or loosen the elastic material through the clasp until the wristband fits snugly but comfortably.

We recommend that you close the clasp and wear the band with the excess tail extended for a day to be sure the adjustment is snug, comfortable, and has the proper electrical contact with the skin before cutting.

5. Test the wrist strap system to be sure of proper electrical resistance and skin contact. Use the procedure described under "Testing" section on reverse side.

6. When you are ready to cut off excess material, mark with a pencil where excess material is to be trimmed.

7. Remove band from wrist. Open clasp. Cut off strip excess material about 1/4" short of pencil mark so that the end of material is concealed by cap. This will eliminate the possibility of frayed ends.

8. Close clasp and use as a fixed elastic wristband.

For more information on ESD Systems.com adjustable wristbands ask for Drawing TD-22005.

## Adjustable Metal Expansion Wristbands

With either 4mm or 7mm snaps

1. Insert the link-end of the wristband into the slotted opening on the cap. Insert it at a downward angle to allow the links to slide inside the channel in the backplate.

2. Change the size of the band by sliding the links in or out of the stainless steel backplate. For extra small wrist sizes you can cut off excess links with cutters.
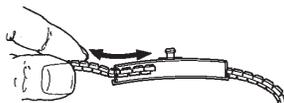
3. Lock the links into place by pulling down on the band, seating the band securely over the lip on the edge of the backplate.
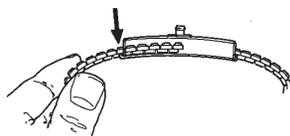
4. Test the wrist strap system to be sure of proper electrical resistance and skin contact. Use the procedure described under "Testing" section on reverse side.

For more information on ESD Systems.com Adjustable Metal Expansion Wristbands ask for Drawings TD-21240 or TD-21305.

Disposable Wrist Strap

This wrist strap provides an effective, economical alternative when short-term ESD protection is required. The disposable wrist strap can be shipped with ESD-sensitive components whose manufacturers recommend that the installer of the component ground himself during installation so static damage does not occur.

1. Wrap wrist strap around wrist and attach adhesive securely.

2. Test the wrist strap system to be sure of proper electrical resistance and skin contact. Use the procedure described under "Testing" section on reverse side.
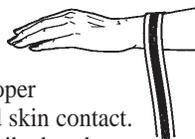
For more information on ESD Systems.com disposable wrist straps ask for Drawing TD-22350.

Visit our online library of Tech Briefs:
http://www.esdsystems.com

Note: ESDSystems.com wrist straps and coil cords are UL Listed for safety. However, this product is not recommended for use on equipment with operating voltage exceeding 250 VAC.

CAUTION: The ESD Series is for electrostatic control. It will not reduce or increase your risk of receiving electric shock when using or working on electrical equipment. Follow the same precautions you would use without wrist straps, including:

- *Make certain that equipment having a grounding type plug is properly grounded.*
- *Make certain that you are not in contact with grounded objects other than through the ESD Series.*

Limited Warranty

ESD Systems.com expressly warrants that for a period of one (1) year from the date of purchase, ESD Systems.com wrist strap components will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a unit will be replaced at ESD Systems.com option, free of charge. Call Customer Service at 508-485-7390 for a Return Material Authorization (RMA) and proper shipping instructions and address. Include a copy of your original packing slip, invoice, or other proof of purchase date. Any unit under warranty should be shipped prepaid to the ESD Systems.com factory. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, call Customer Service at 508-485-7390 for a Return Material Authorization (RMA) and proper shipping instructions and address. Ship your unit freight prepaid. ESD Systems.com will quote repair charges necessary to bring your unit up to factory standards.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will ESD Systems.com or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.

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