

Wrist Straps Grounding, Testing and Maintenance



Location of Proper Earth Bonding Point

Wrist straps, working surfaces and floor mats which are to be grounded for protection against electrostatic discharge (ESD) should be grounded to a Earth Bonding Point (EBP). The Earth Bonding Point should be connected to the ESD protected area (EPA) ground.

"The primary means of grounding personnel shall normally be by a wrist strap connected to an EBP [Earth Bonding Point]." "The wrist strap shall consist of a band that fits snugly around the wrist and a cord to connect the band to an EBP. The wrist strap shall incorporate a quick release connection. The cord shall have a termination compatible with the EBP and shall incorporate at least one insulated current-limiting resistor. The total resistance from hand to EBP shall be in accordance with table 1 [Rg 7,5 x 10E5 to 3,5 x 10E7 ohms]." (EN 61340-5-1 paragraph 5.5 and 5.2.7)

"An easily accessible dedicated EBP for the wrist strap shall be established adjacent to each working area, or working surface. A sufficient number of EBP shall be provided for operators and visitors. An EBP shall be connected to the EPA ground. Wires shall be shrouded by insulating material. The EBP shall be clearly marked" (EN 61340-5-1 paragraph 5.3.3)

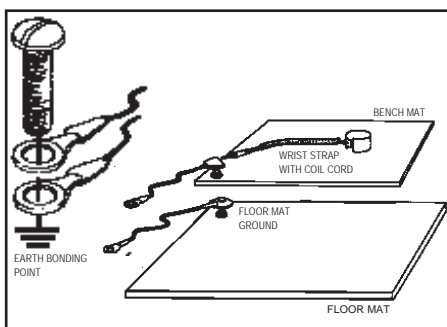


Figure 1. Earth bonding point for each workstation

This may be accomplished in a variety of ways utilizing earth bonding point plugs, ground buses or connecting directly to the nearest mains supply ground.

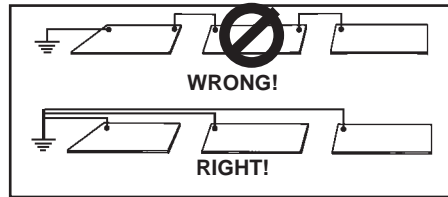


Figure 2. ESD working surfaces should never be grounded in series, i.e. daisy-chained

Each individual workstation must be individually grounded to the ground bus or to the nearest 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 instructions on grounding Vermason workstation mats see for technical bulletin TB-7505.

Test The Ground Before You Use It And Periodically Thereafter

You should not assume that any AC mains socket 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.**

A Banana Jack Is Recommended

Almost all wrist strap manufacturers terminate wrist 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 required by EN 61340-5-1 table 1.

In some European countries, the use of ground cords with 4 mm banana plugs is not permitted. We can supply 10 mm male and female snap terminations to comply with regulations where required.

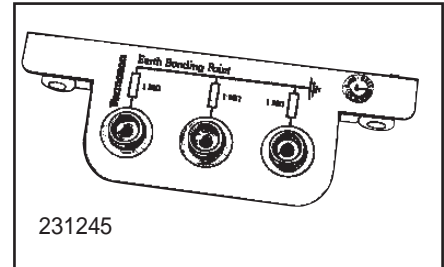


Figure 3. Vermason 231245 Slim Earth Bonding Bar is an easy way to provide multiple banana jacks at any work station

Compliance Verification of the Ground System

Set up a schedule to be sure that all EBPs 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.

"Wrist straps shall be checked before use. Each check shall be made with the wrist band worn in contact with the wearer's skin and with the ground cord attached to the appropriate tester." (EN 61340 5 1 paragraph 9.6 Daily Checks, paragraph 9.6.2 Wrist Strap)

Vermason has several testers available for this purpose. Power cords must be ordered separately. For more information ask for specification drawings or operating instructions by item number.

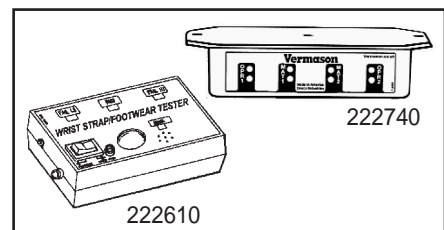


Figure 4. Wrist strap testers

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.

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.

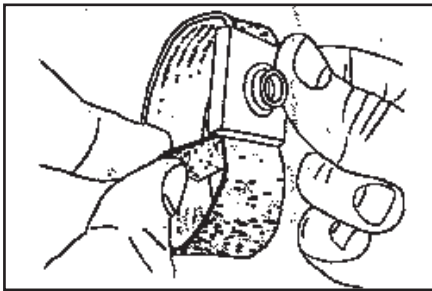
Woolite™ works well. Liquid detergents are better than dry in that there is less caking and frictional wear. Launder elastic wrist band strips in cool or warm water, tumble dry with low heat or hang dry. This works well if using a standard house machine on gentle cycle. Industrial machines are fine if "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

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.

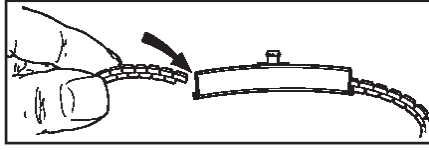
1. Place the wristband on the wrist.
2. Pull the "tail" of material that extends out from the clasp to tighten the elastic material until the wristband fits snugly but comfortably.



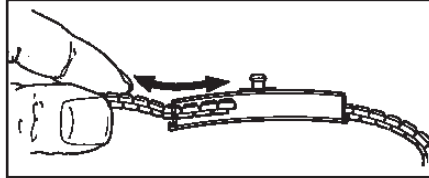
3. Using the equipment shown in Figure 4 under "Testing", test the wrist band while it is worn to be sure of proper electrical resistance.

METAL EXPANSION WRISTBANDS

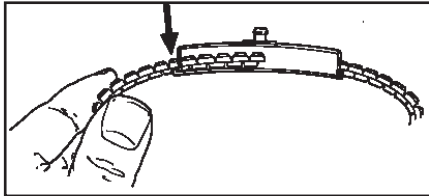
1. Insert the link end of the wristband into the slotted opening on the cap. Insert it at a downward angle to allow the links to slide inside the channel in the backplate.



2. Change the size of the band by sliding the links in or out of the stainless steel backplate. For extra small 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.

WRITE FOR A FREE CATALOGUE OF OTHER VERMASON PRODUCTS INCLUDING STATIC GROUNDING MATS, TOOLS, AND ACCESSORIES FOR ELECTRONIC ASSEMBLY, TESTING AND REPAIR.

NOTE: Vermason 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

Vermason expressly warrants that for a period of one (1) year from the date of purchase, our wrist straps and components will be free of defects in material (parts) and workmanship (labour). Within the warranty period, a unit will be tested, repaired or replaced at Vermason's option, free of charge. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. You should 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 Vermason factory. Warranty replacements will take approximately two weeks.

If your unit is out of warranty, call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and proper shipping instructions and address. Ship your unit freight prepaid. Vermason 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 Vermason 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.