NVMT Static Protective Laminate Installation and Maintenance

Made in America

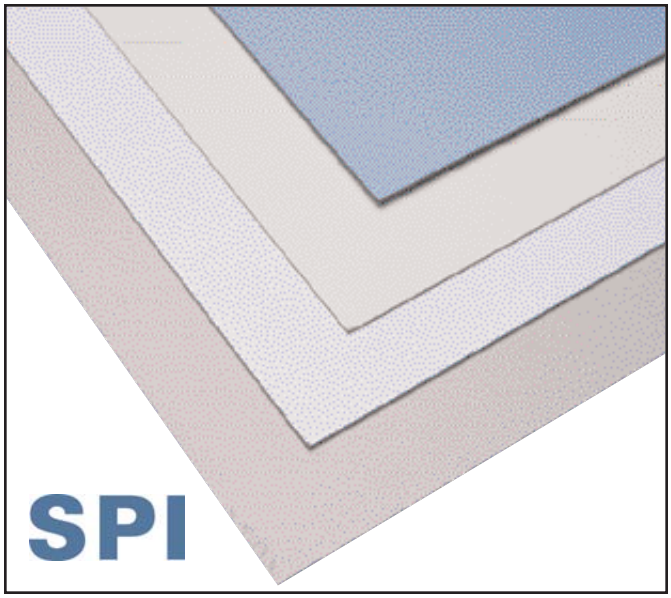

Figure 1. NVMT Protective Laminate
Blue, Gray, Beige, White, Almond

Description

NVMT is a high pressure static dissipative laminate designed for workbench tops used in the manufacture and assembly of ESD susceptible electronic components. NVMT meets ANSI/ESD S20.20 requiring RTG <10^9 Ohms per ESD S4.1 and antistatic low tribocharging materials <200 volts per ESD STM 4.2. Its multi-layer construction features a conductive layer which ensures dissipative properties independent of ambient humidity. NVMT shows superior abrasion resistance and provides rapid, non-sparking charge dissipation. It can be laminated to plywood, fiber board, partical board tables and bench tops with conventional contact adhesives. It is resistant to most solvents and greatly exceeds the NEMA specification for wear resistance. The NVMT brand and ESD protective symbols are featured on laminate sheets for protection and auditing purposes.

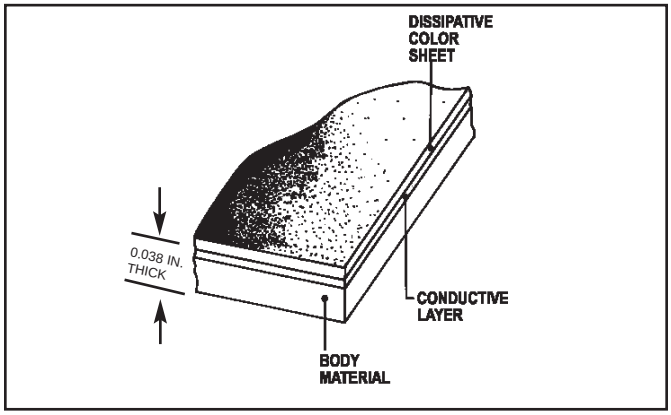

Figure 2. NVMT layered construction

Installation

NVMT is designed to be used as a portable worksurface or laminated to wooden tables or bench tops with conventional contact adhesive.

1. Prepare the face of the substrate. It should be clean, dry and free of all contaminants which would interfere with adhesion. All the materials, NVMT, substrate and cement, must be allowed to condition at 70°F to 75°F and 45-50 percent relative humidity for 48 hours prior to assembly.

2. Stir the adhesive thoroughly and apply an even coat of adhesive by either spray, roller or brush to both the substrate face and the NVMT back. Do not allow coated surfaces to touch. Allow the cement to dry. When bonding to plywood, apply a second coat if the first coat completely penetrates the wood. Use uncoated wood strips to assist in connecting coated surfaces.

3. Place thin, uncoated, wooden strips 12 inches apart across the substrate face. This will keep coated surfaces apart; bonding will occur once contact is made.

4. Position the over-cut NVMT sheet on top of the wooden strips.

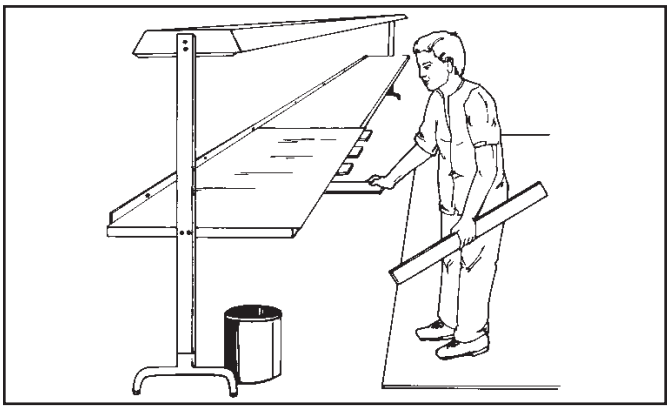

Figure 3. NVMT sheet on wooden strips

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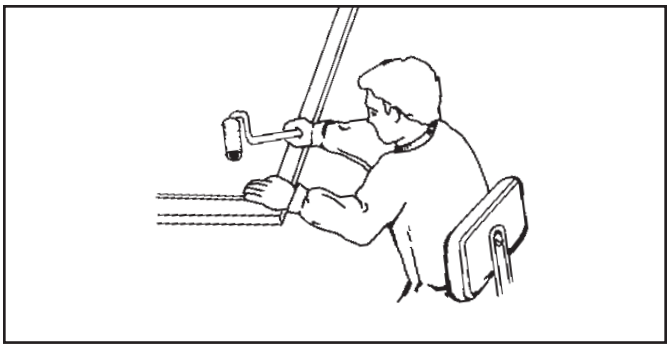

Figure 4. Wooden block and rubber mallet and "J" roller technique.

5. Slowly remove strips of wood taking care to keep the NVMT in position. The NVMT should fall into position.

6. Push the laminate down with even hand pressure.

7. If the NVMT falls out of position, squirt solvent (SPI Westek recommends the use of ST102 solvent from Pionite) between the two surfaces and gently lift the NVMT sheet up. Wait a minimum of 4 hours before reapplying another coat of adhesive, solvent must evaporate totally. Apply another coat of adhesive to both surfaces and reposition.

8. When NVMT is in the correct position, seal the bond with a rubber "J" roller or a carpeted block and rubber mallet. Use either roller or block and mallet in a pattern that forces any air bubbles out from underneath laminate. If NVMT sheet is oversized, sheet can now be trimmed with a router. After trimming, edges should be filed for a smooth splinter free edge.

Once installed, NVMT must be grounded to ensure proper charge dissipation. Refer to general grounding guidelines on this page.

Fabrication Tips

1. All saw blades and router bits used for cutting should be carbide tipped. Feed rate should be slow and tool speed should be high. To minimize the development of surface scratches caused by router bits, lubricating the laminate edge with a wax stick is recommended prior to tooling.

2. Inside corners of cutouts for electrical outlets, sinks, etc., should have a minimum radius of 1/8" (3mm) and should be filed smooth. This reduces the likelihood of stress cracks.

3. All edges of laminate should be filed smooth with file direction towards substrate to help prevent stress cracks and to minimize chipping.
4. When nails or screws must be used, it is advisable to first drill an oversized hole through the laminate. This reduces the likelihood of stress cracks.

5. NVMT is intended for interior use only, and should not be exposed to extreme humidity, continuous sunlight, or temperatures above 275°F (135°C) for extended periods of time.

6. Work surfaces must be grounded for proper static dissipation.

For more information on the characteristics of nonindustrial laminates related to end-user applications please refer to National Electrical Manufacturers Association, publication LD 3-1995. The address for NEMA is:

NEMA
1300 North 17th Street, Suite 1847
Rosslyn, Virginia 22209
Phone: 703-841-3200
Web: www.nema.org.

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General Grounding Guidelines

1. When grounding NVMT, it is essential to make intimate contact with the conductive layer which is directly below the dissipative, color layer. See the diagram on page 1 showing the multi-layered construction.

2. For proper and safe ESD protection, the grounding wire must be tied directly to and at the same potential as the facility power ground or "green wire" ground. A typical "green wire" ground if properly wired is the screw of a switch or outlet cover plate.

3. If power is to be used at the ESD protected workstation, per ANSI/ESD S20.20 paragraph 5, a Ground Fault Circuit Interrupter (GFCI) is recommended.

4. Test all workstation grounds for proper resistance to ground. For information on instruments and procedures for the proper testing of grounds we recommend that you contact ECOS Electronics, 205 Harrison Street, Oak Park, IL 60304, (708) 383-2505, Fax (708) 383-2137.

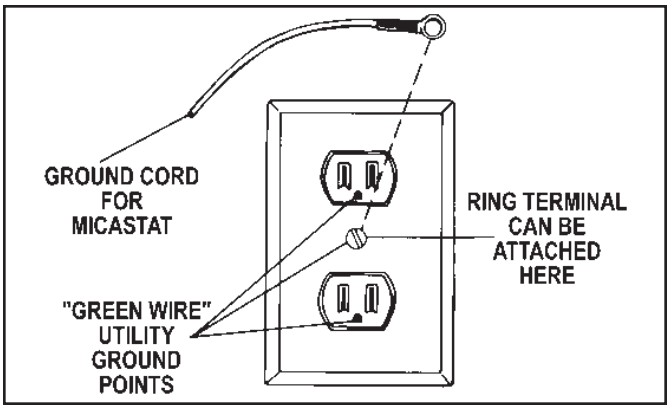


Figure 5. Outlet plate with "green wire" ground

5. The selection of ground cords is intimately related to the organization's material handling procedures. It is important for a user to be familiar with his/her own organization's grounding specifications and ESD procedures prior to selecting ground cords. See paragraph 2 in Cautions section of this Technical Bulletin.

Grounding Methods for Installed Sheet Goods

SPI Westek offers two styles of ground systems that will ground your static dissipative laminate worksurface: Item No. 96580 and 96581. These ground assembly kits are for use when the laminate sheet is installed on a wooden workbench top.

1. **Item No. 96580,** our Laminate Grounding System contains all the items needed to properly ground a permanently installed NVMT top. This includes a 10 foot grounding wire terminated with a one megohm resistor and No. 10 ring terminal and a grounding bolt complete with single wrist strap banana jack connection terminal.

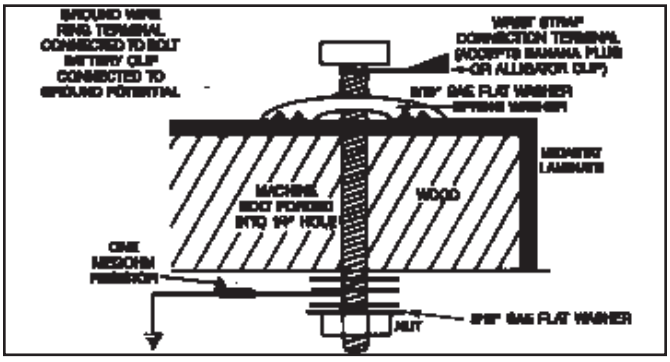
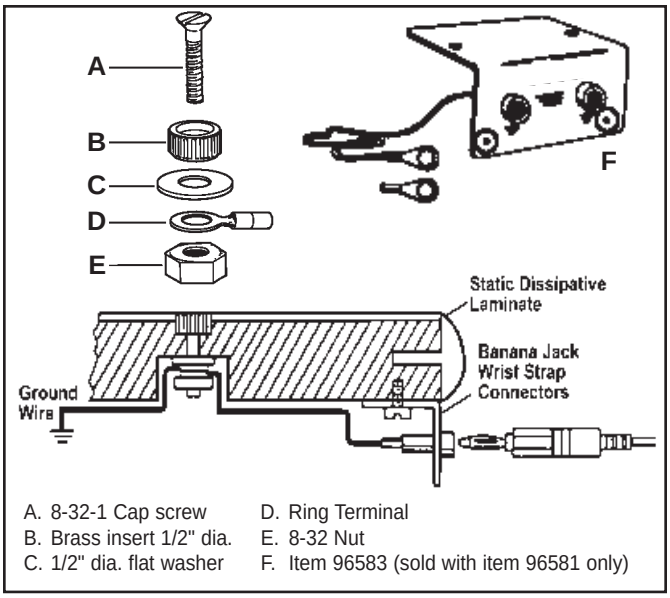


Figure 6. Installation of 96580.

2. **Item No. 96581,** our Flush Mount Laminate Ground Insert with Bench Ground is also available without a dual wrist strap ground sold as Item No. 96584. Both 96584 and 96581 can be easily installed with our Drill Kit Item No. 96582.



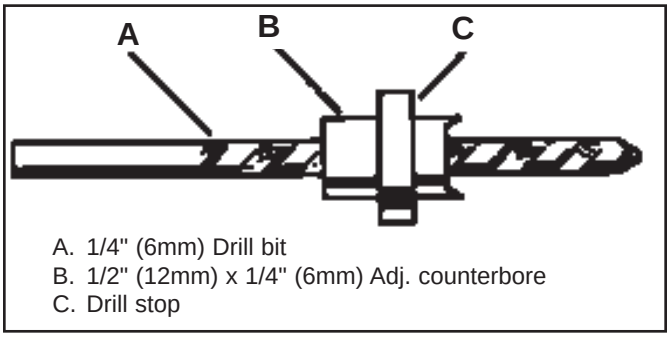
A. 8-32-1 Cap screw
B. Brass insert 1/2" dia.
C. 1/2" dia. flat washer
D. Ring Terminal
E. 8-32 Nut
F. Item 96583 (sold with item 96581 only)

Figure 7. Component Parts and Installation of 96584 and 96581.

Installing the Flush Mount Insert Ground System

The following instructions are based on a top with a thickness of 1-1/4" (30mm) tops.

2.1. Using drill tool 96582:



A. 1/4" (6mm) Drill bit
B. 1/2" (12mm) x 1/4" (6mm) Adj. counterbore
C. Drill stop

Figure 8. Drill Tool 96582.

a. Set the 1/4" (6mm) drill bit and adjustable counterbore so that the 1/4" (6mm) bit will drill clear through the work surface.

b. Set the drill stop so the drilling depth of the 1/2" (12mm) counterbore is .200" (+.000" - .010")

2.2. Using the drill kit 96582 as adjusted above, position drill bit on the top of the worksurface at the point you want to install the flush mount insert.

2.3. Drill perpendicular from the top surface straight into the work surface until the drill stop touches the laminate surface. This should be at a depth of .200".

2.4. Using the 1/4" (6mm) pilot hole on the bottom of the work surface drill a 1 1/2" (37mm) diameter counterbore 5/8" (16mm) deep, of no more than 1/2 the thickness of the worksurface.

2.5. Seat the 8-32 cap screw through the brass insert so that it sits flat with the top of the insert.

2.6. Push the cap screw and brass insert assembly into the 1/2" (12mm) diameter hole on top of the worksurface. Attach and tighten the 8-32 nut until the brass insert is flush with the laminate surface.

2.7. Remove the 8-32 nut and install the flat washer, ring terminal and 8-32 nut as shown above. The ring terminal is for a ground wire attachment.

2.8. Using approximately 22 gauge wire, crimp the supplied ring terminal to the wire and secure it to the 8-32 cap screw using the 8-32 nut. Attach the unterminated wire end to a building ground. THE NVMT WORKSURFACE IS NOW GROUNDED.Recommended practice per ANSI/EOS/ESD S6.1-1991 is no resistor between the common point ground terminal and a worksurface, floor mat, or shelving.

2.9. FOR INSTALLING dual wrist strap ground (item 09740) included with item 96581 ONLY. Place item 96583 at the position desired to install, screw in place using enclosed screws.

2.10. Using the ground wire from the 96583, cut the length of the ground cord so that it will reach from the 96583 to the underside of the worksurface at the 8-32 screw. Crimp the extra ring terminal to the end of the wire and bolt it to the underside of the work surface using the 8-32 cap screw and nut.

2.11. Using the remaining wire cut from the 96583, attach the ring terminal end to the 8-32 cap screw and nut. Using the ring terminal enclosed, terminate the other end to a ground source. This will GROUND both the NVMT® top and the dual wrist strap ground.

Testing

There are two types of tests for monitoring NVMT surface electrical characteristics. One type of test is RTG - Resistance To Ground (see Figure 9). In this test you measure the resistance of the laminate surface to the installed ground bolt (or snap on a NVMT Pad). When performing this test on NVMT Pads the snap serves as the ground point.

A second type of test is RTT (Resistance, Point to Point). Here you measure the resistance from one 5 lb. electrode to another 5 lb. electrode; see electrode test positions A, B, C, and D in RTT test diagram, Figure 10. This is the test that is more typically used in the laboratory to determine NVMT compliance with electrical specifications.

Both test procedures are outlined in this Technical Bulletin using the SPI Westek Surface Resistance Test Kit Item No. 94057.

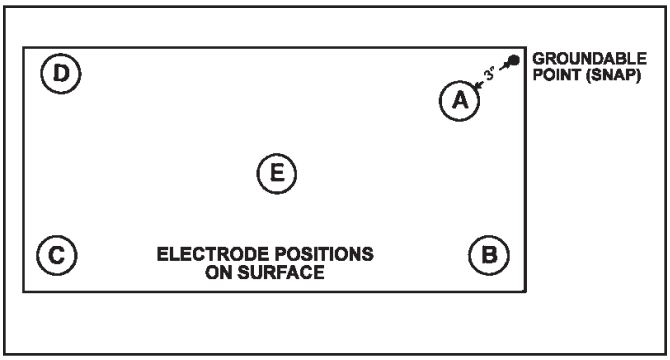


Figure 9. Electrode positions on surface of pad, RTG test.

Resistance To Ground (RTG):

1. Locate the five pound electrode positions, as described below, to be used on the NVMT surface in relationship to the installed ground bolt (or snap on the NVMT Pad). Use the relative positions shown above.

A - At least 2" from any surface edge and 3" from the ground bolt.

B, C & D - The farthest corners from the ground bolt and 2" from any surface edge.

E - The geometric center of the surface.

2. Disconnect the surface to be tested from its normal ground connection.

3. Connect one black lead to the meter and the other end of this lead to the 5 lb. electrode.

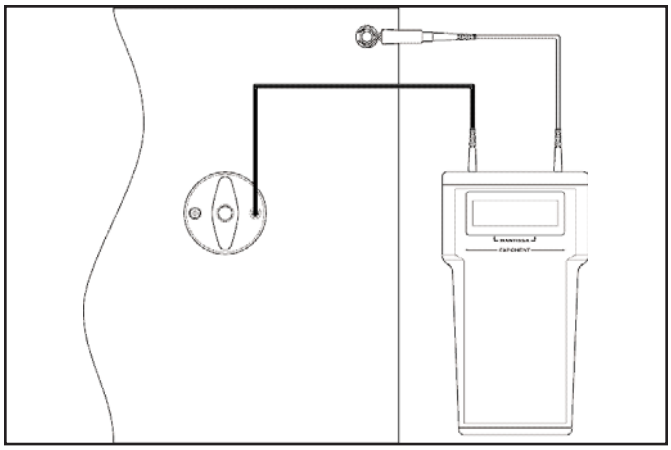


Figure 10. Proper connection of leads.

4. Connect the other black lead to the meter and the groundable point on the mat.

5. Place the electrode at position A on the mat (see the RTG diagram) and set the meter selector switch to 100V.

6. Push on On/Off button, for the 15 second electrification period and then record the reading in ohms.

7. Release the On/Off button. Move the electrode to each of the other four positions on the surface and repeat the test.

8. Average the results of the five readings to obtain an average measurement of the resistance of surface to ground.

Resistance Point to Point (RTT):

1. Locate the four pair of electrode positions to be used approximately as shown in the RTT test diagram above. Position electrodes at least 10 inches apart and not less than two inches from any edge.

2. Disconnect the surface to be tested from its normal ground connection.

3. Connect one end of the black lead to the meter connect the other end of this lead to either one of the electrodes. It does not matter which lead is connected to which weighted electrode.

4. Connect the other lead to the meter. Connect the other end to the other weighted electrode.

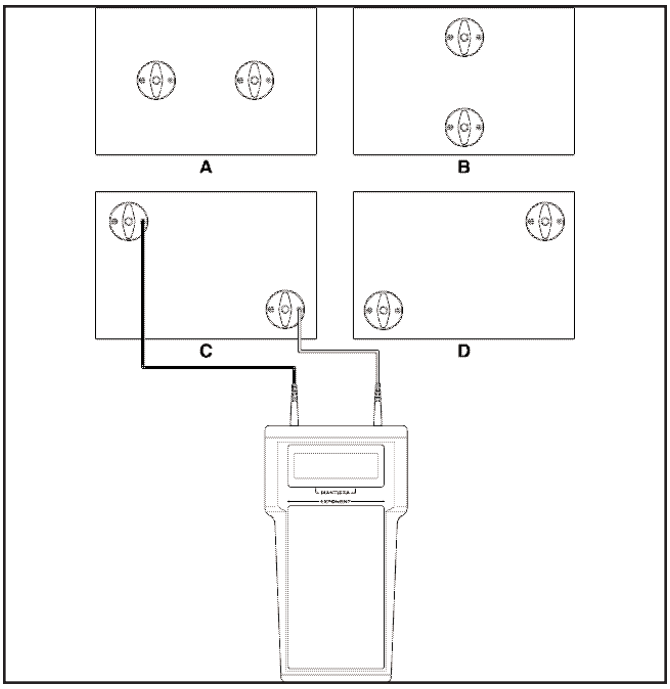


Figure 11. Electrode positions on surface of pad, RTT test.

5. Place the electrodes in position A as shown in RTT test diagram (Fig. 9). Set the meter selector switch to 100V.

6. Push the On/Off button, for the 15 second electrification period and then record the reading in ohms.

7. Release the On/Off button. Move the electrode to each of the other three positions on the surface and repeat the test.

8. Average results of the four readings to obtain an average measurement of the resistance of the surface between two points.

Maintenance

1. It is important to store NVMT laminate sheets at the same relative humidity as the material to which it will be bonded. This will prevent a moisture imbalance in application.

2. NVMT may swell slightly if a damp object is kept in continuous contact with the surface for more than 12 hours. This is normal; the swelling will disappear soon after the damp object is removed.

3. NVMT may be cleaned with Resque 2 Antistatic Surface and Mat Cleaner, Item No. 96565 or any household soap solution. Be careful that household soaps are silicone free and do not leave an insulative layer behind. This will reduce electrical properties. Difficult stains may be removed with organic solvents such as acetone, alcohol, methylethyl ketone (MEK) or paint thinner.

RoHS Compliance Statement
None of the following materials are intentionally added in manufacturing this product: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) as outlined in the Directive 2002/95/EC Article 4.1. See Desco Industries Inc. letter on-line at SPIwestek.com.

Limited Warranty

SPI Westek expressly warrants that for a period of one (1) year from the date of purchase, SPI Westek NVMT Static Protective Laminate will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a unit will be tested, repaired or replaced at SPI Westek's option, free of charge. Call our Customer Service Department at 909-664-9986 for a Return Material Authorization (RMA) and proper shipping instructions and address. Please include a copy of your original packing slip, invoice, or other proof of date of purchase. Any unit under warranty should be shipped prepaid to the SPI Westek factory. Warranty replacements will take approximately two weeks.

If your unit is out of warranty, call our Customer Service Department at 909-664-9986 for a Return Material Authorization (RMA) and proper shipping instructions and address. SPI Westek 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 SPI Westek 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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