



ESD

ELECTRO STATIC DISSIPATIVE
HIGH PRESSURE LAMINATES

Technical Bulletin

Nevamar® ESD is an electrostatic dissipative laminate designed for work surfaces in the manufacture and assembly of static-sensitive electronic components. ESD offers the user a static safe work surface with the performance of a high pressure decorative laminate. Due to the unique composition of this product, ESD colors and corresponding colors of standard Nevamar® HPL are not exact matches. Sample evaluation is recommended.

Nevamar® ESD offers:

- Low electrical resistance. Surface to ground less than 1×10^9 ohms.
- Absolute charge drainage and zero voltage suppression. ESD exhibits no voltage suppression and dissipates a 5,000 volt static charge to zero in less than 0.01 second per FTM-101C at 5 to 95 percent relative humidity.
- ESD is postformable, but will require a larger radius than standard laminate.
- Resistant to most common solvents, hot solder and fluxes.
- ESD is guaranteed to maintain its static control properties.

Product Description

Standard Nominal Sizes

Type	Thickness	Width	Length	Colors*
NA28 (in)	0.028	36, 48, 60	96, 120, 144	Solids Only
(mm)	0.7	914, 1219, 1524	2438, 3048, 3658	
NA38 (in)	0.036	36, 48, 60	96, 120, 144	Solids Only
(mm)	0.9	914, 1219, 1524	2438, 3048, 3658	

*Due to the unique composition of this product, ESD colors and corresponding colors of standard Pionite® HPL are not exact matches. Sample evaluation is recommended.

Other widths and thicknesses of ESD are available upon request.

Color and Finish Availability

Colors available:

SN2064 Beige	ST6055 Graystone
SN2065 Almond	SW7028 White
ST6025 Gray	S6074 Black

Nevamar® ESD laminate is available in T - ARP (Armored Protection®) finish only. T - ARP finish is a low gloss, textured finish with a 60 degree gloss meter reading of 12 ±3 gloss units.

Typical Uses

ESD laminate was developed specifically for surfacing work stations where static-sensitive electronic components are manufactured. They also work well in hospitals, medical facilities, and clean rooms as they provide a surface that will not attract dust or dirt particles.

Postforming

When working with ESD laminate, these techniques will produce a quality application.

1. Proper conditioning of the laminate, substrate, and backing sheet minimizes possible warping, shrinking, or expansion of assembled panels. Ideally, all components should be conditioned at 70 °F to 75 °F (21 °C to 25 °C) and 45 to 50 percent relative humidity for 48 hours prior to assembly.
2. The radiused edge of substrate must be smooth, rounded, and free of irregularities and loose particles.
3. Always bond ESD laminate to a suitable substrate such as medium to high density fiberboard, or particleboard. It should not be glued directly to plaster walls, gypsum wallboard, concrete, or metals.
4. The use of a backing sheet is recommended to minimize warpage. The thickness of the backing sheet should be relatively equal to the thickness of the decorative laminate on the face of the assembly.
5. The decorative surface to be formed should be heated to a temperature of 325 °F to 375 °F (165 °C to 190 °C).
6. The desired heat-up rate to 325 °F (165 °C) should be one second 165 °C for every 0.001" of thickness (i.e., 28 seconds for A28, 36 seconds for A38).
7. Forming should be accomplished within 5 seconds of achieving proper surface temperature.

Fabrication Tips

- All saw blades and router bits used for cutting should be carbide tipped. Feed rate should be slow and tool speed should be high.
- Inside corners of cutouts for electrical outlets, sinks, etc., should have a minimum radius of 1/8" (3 mm.) and be filed smooth. This reduces the likelihood of stress cracks.
- All edges of laminate should be filed smooth with file direction towards substrate to help prevent stress cracks and to minimize chipping.
- When fasteners must be used, it is advisable to first drill an oversized hole through the laminate. This reduces the likelihood of stress cracks.
- ESD 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.
- Work surfaces must be grounded for proper dissipation.

Test Information

Physical Properties

TEST METHOD		NEMA LD3-2005	Typical ESD Values NA28	NEMA STD* VGP	Typical ESD Values NA38	NEMA STD* HGP
Thickness	(in.)		0.028 ± 0.003	0.028 ± 0.004	0.036 ± 0.003	0.039 ± 0.005
	(mm.)		0.7 ± 0.08	0.7 ± 0.1	0.9 ± 0.08	1.0 ± 0.12
Appearance		3.1	Complies		Complies	
Light Resistance		3.3	Slight effect	Slight effect	Slight effect	Slight effect
Cleanability		3.4	5	20 (max)	5	20 (max)
	Stain 1-10		No effect	No effect	No effect	No effect
	Stain 11-15		No effect	Moderate effect	No effect	Moderate effect
Boiling Water Resistance		3.5	Moderate effect	Slight effect	Moderate effect	Slight effect
High Temperature Resistance		3.6	Slight effect	Slight effect	Slight effect	Slight effect
Ball Impact Resistance	(in.)	3.8	25	20 (min.)	35	30 (min.)
	(mm.)		635	500 (min.)	889	750 (min.)
Dimensional Change		3.11				
Machine Direction	(%)		0.4	1.10 (max.)	0.4	1.10 (max.)
Cross Direction	(%)		0.8	1.40 (max.)	0.8	1.40 (max.)
Wear Resistance	(cycles)	3.13	1000	400 (min)	1000	400 (min)
Formability		3.14				
Outside Radius	(in.)		1/2	1/2 (min.)	5/8	5/8 (min.)
	(mm.)		13	13 (min.)	16	16 (min.)
Inside Radius (Cove)	(in.)		3/16	Not Applicable	3/16	Not Applicable
	(mm.)		5	Not Applicable	5	Not Applicable
Blister Resistance	(sec.)	3.15	50	40 (min.)	60	55 (min.)

*Nevamar® ESD is not covered by ANSI/NEMA LD3 specifications; however, the physical properties are similar to VGP and HGP grades.

Typical Electrical Properties

Test	Relative Humidity	Electrical Results
Point to Point Resistance ¹	60% - 40%	10 ⁶ to 1 x 10 ⁷ ohms
	40% - 20%	10 ⁷ to 1 x 10 ⁸ ohms
	20% - 10%	10 ⁸ to 10 ⁹ ohms
Point to Ground Resistance ¹	60% - 40%	10 ⁵ to 1 x 10 ⁷ ohms
	40% - 20%	10 ⁷ to 1 x 10 ⁸ ohms
	20% - 10%	10 ⁸ to 10 ⁹ ohms
Volume Resistance ²	60% - 30%	10 ⁷ to 1 x 10 ⁸ ohms
	30% - 10%	10 ⁸ to 10 ⁹ ohms
Static Decay ³	50%	0.01 sec
	10%	0.02 sec

¹ Per EOS/ESD - S 4.1

² Measured Face to Back at 72 F, 100 V with a LCD Megohmmeter, Item No. 19770, NFPA Electrodes (2.5 inch diameter, 5 pounds)

³ FTMS 101C, Method 4046

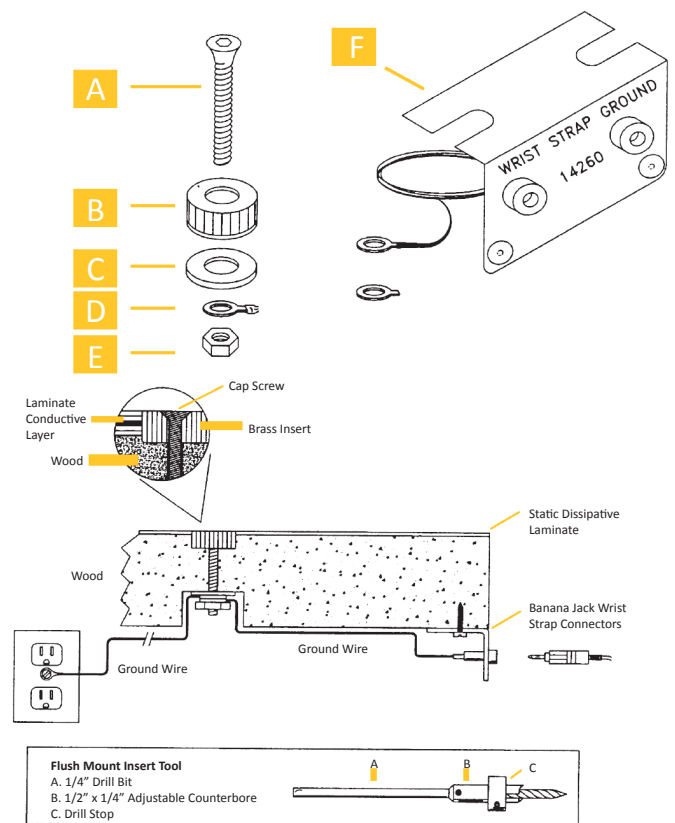
ESD Laminate Grounding Procedure

Description

The flush mount insert provides an excellent “flush to surface” ground for ESD laminate. The system uses a straight knurl for optimal electrical contact with the laminate. The flush mount insert system includes all components necessary to ground the laminate. Also included is all the hardware required for the attachment of two banana jacks to the front surface. For easy installation, use the flush mount tool shown below.

Key:

- A** Flat socket cap screw 8-32-1, secures the brass insert into place
- B** Brass insert, 1/2” dia. straight knurl provides electrical connection to the laminate
- C** Washer, Flat, 1/4” ID, 1/2” OD, provides a flat surface for securing ring terminals
- D** Terminal, ring, mechanically connects up to 16 gauge wire to the flush mount insert
- E** Nut, 8-32, used to fasten flush mount insert system together
- F** Dual banana jack terminals, 10’ of 22 gauge wire, provides two banana plug connections in front of work surface grounded to the flush mount insert system



Care and Maintenance

Many commercially available products contain substances that may damage or discolor a laminate surface. **ABRASIVE CLEANERS SHOULD NOT BE USED.** Particular care should be used with any products labeled **CAUTION** or **WARNING**. Any questions or concerns should be referred to the product’s manufacturer or call 1-877-726-6526. Do not allow harsh materials to remain in contact with the laminate surface. Examples of these are as follows:

- Toilet bowl cleaners
- Chlorine bleach
- Hydrogen Peroxide
- Coffee pot cleaners
- Oven cleaners
- Hard water stain removers
- Drain cleaners
- Fruit and berry juice
- Metal cleaners and polishes
- Tub and tile cleaners

Limited Warranty

Subject to the limitations set forth below, Panolam® Industries International Inc. (Panolam) expressly warrants that our products are reasonably free of defects in material and workmanship, and when properly handled and fabricated will conform, within accepted tolerances, to applicable manufacturing specifications as set forth in our technical brochure. This warranty shall extend to the original buyer for a period of twelve (12) months from the date of shipment of this product by Panolam, and shall not be assignable by the original buyer. This warranty does not cover damage resulting from accident, misuse, alteration, abuse or lack of reasonable care.

Due to the variety of uses and applications to which this product may be put, and because the manufacturer has no control over the end products fabricated, the warranty set forth above is exclusive and in lieu of all warranties, expressed or implied, in fact or by operation of law or otherwise, or arising by course of dealing or performance, custom or usage in the trade, including, without limitation, the implied warranties of fitness for a particular purpose and merchantability, and Panolam shall have no obligation or liability to any person or entity in connection with or arising from the furnishing, sale, installation or repair, use or subsequent sale of any product supplied by it.

Our maximum liability arising out of the sale of the products or their use, whether based upon warranty, contract, tort or otherwise, shall not exceed the actual payments received by us in connection therewith. In no event shall we be liable for special, incidental or consequential damages, including, but not limited to, arising hereunder or from the loss of profits, or loss of use damages, sales of the products.

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