

# Technical Bulletin

## ESD ELECTRO STATIC DISSIPATIVE HIGH PRESSURE LAMINATES

**This ESD laminate** 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 HPL are not exact matches. Sample evaluation is recommended.

ESD laminate offers:

- Low electrical resistance. Surface to ground less than  $1 \times 10^9$  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
A28	(in.) 0.028	36, 48, 60	96, 120, 144	Solids only
	(mm) 0.7	914, 1219, 1524	2438, 3048, 3658	
A38	(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 HPL are not exact matches. Sample evaluation is recommended.

Other widths and thicknesses of ESD are available upon request.

### Finish

ESD laminate is available in LS Suede finish only. LS Suede finish is a low gloss, textured finish with a 60 degree gloss meter reading of  $8 \pm 3$  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

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.
2. 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.
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 fasteners must be used, it is advisable to first drill an oversized hole through the laminate. This reduces the likelihood of stress cracks.
5. 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.
6. Work surfaces must be grounded for proper dissipation.

## Technical Information

### Physical Properties

TEST METHOD		NEMA LD 3-2005	TYPICAL ESD Values A28	NEMA STD* VGP	TYPICAL ESD Values A38	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	600	400 (min.)	600	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.)

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

### Electrical Properties

RTG less than  $1 \times 10^9$  ohms

EOS/ESD-S4  
DIN 53 276

RTT less than  $1 \times 10^9$  ohms  
greater than  $1 \times 10^6$  ohms  
at 12% RH - 50% RH

EOS/ESD-S4.1  
ASTM F-150-72  
NFPA-99

RVOL less than  $10^9$  ohms

ASTM D257

Charge Decay occurs within .01 seconds

FTMS 101C METHOD 4046

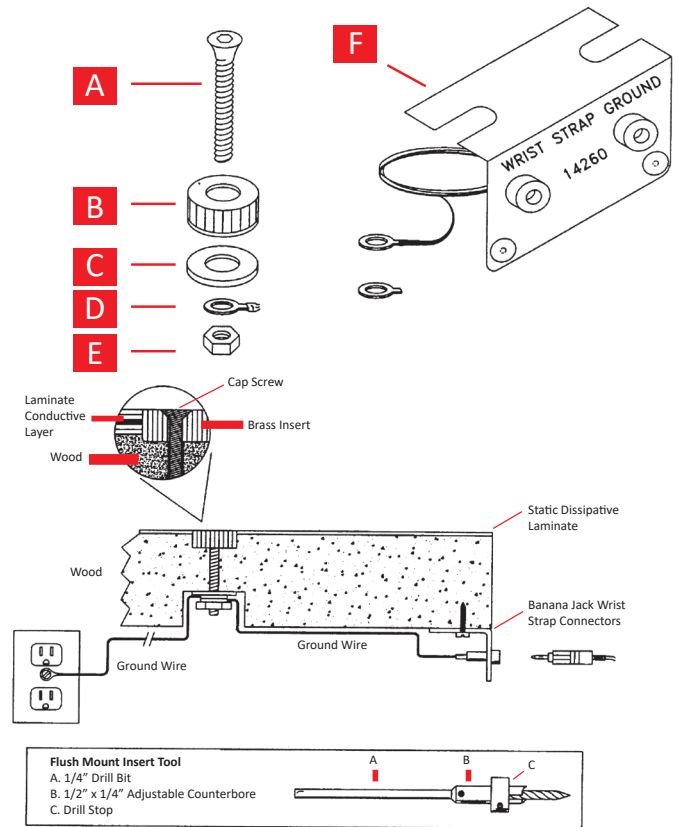
# ESD Laminate Grounding Procedure

## 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 Baskiville's. 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

