

FORMASPACE



ESD
CATALOG

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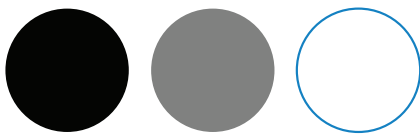


The Formaspace ESD is an electrostatic dissipative laminate designed for work surfaces in the manufacture and assembly of static-sensitive electronic components. ESD offers the user a static safe work surface with the performance of a high-pressure decorative laminate.

It offers low electrical resistance and 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. It is resistant to most common solvents, hot solder and fluxes.

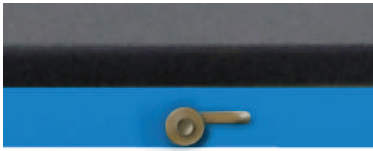
AVAILABLE COLORS:

It has a low gloss, textured finish with a 60-degree gloss meter reading of 12 ± 3 gloss units.



EACH FORMASPACE ESD WORKBENCH CONSISTS OF:

- ESD Laminate – Carbon integrated throughout the laminate provides 106-109 ohms resistance with outstanding tolerance to wear and tear
- Common Grounding Point – designed to maximize the interface between the grounding system and the ESD laminate
- Rotating Grounding Hub – Prevents damage to wrist straps and allows freedom of movement for technicians
- Resistive Wrist Strap – Provides 106 ohms of resistance



Rotating Grounding Hub
(Prevents wrist strap damage)



Common Ground Point



Wrist Strap
with 106 ohm Resistor

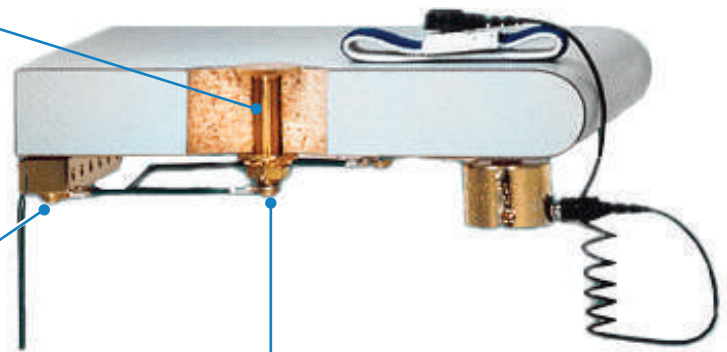


ESD CONNECTION GUIDE

Full ESD Kit contains the ground lug and wire, a user hub, ground wire with 1M ohm resistor, and two user wrist straps. On longer benches it is recommended to consider multiple hubs to not overstretch the wrist strap cords.

ESD Lug - Required to drain static away from surface. ESD Auxiliary Kit contains just the lug and a single ground wire.

The other end of the grounding wire can now be attached to building ground or approved ESD building grounding point as determined by your ESD management program.



Using provided screw and washer, attach grounding wire to end of grounding post (typically located near the back edge of the workbench).



ELECTRICAL PROPERTIES

Test	Relative Humidity	Electrical Results
Point to Point Resistance *	60% - 40% 40% - 20% 20% - 10%	106 to 1 x 107 ohms 107 to 1 x 108 ohms 108 to x 109 ohms
Point to Ground Resistance *	60% - 40% 40% - 20% 20% - 10%	106 to 1 x 107 ohms 107 to 1 x 108 ohms 108 to x 109 ohms
Volume Resistance **	60% - 30% 30% - 10%	107 to 1 x 108 ohms 108 to x 109 ohms
Static Decay ***	50% 10%	0.01 sec 0.02 sec

* Per EOS/ESD - S 4.1

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

*** FTMS 101C, Method 4046



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	0.07 ± 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	40 (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.)

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

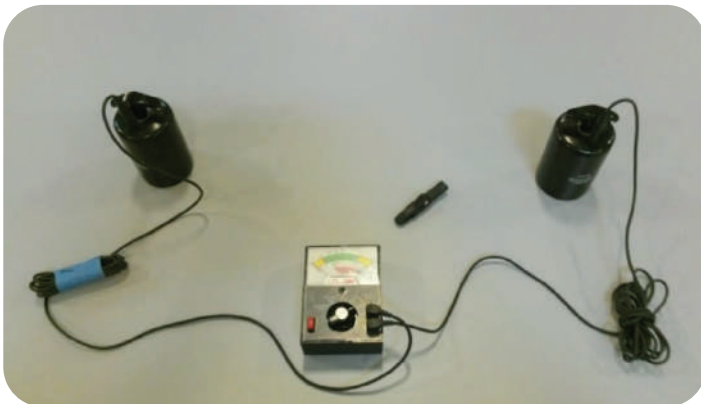
FORMASPACE ESD TESTING PROCEDURE

Purpose of test is to ensure correct assembly procedure for ESD benches and to verify ESD laminate is within the proper dissipative range. Formaspace uses the 3M 701 Megohmmeter for surface resistivity testing.

Be sure to check the battery level prior to testing. Just set the meter to battery test and hit the red test button. It should read dead center on the battery scale.

Hook the meter and weights up as shown. Weights should be about 20" apart. Meter should be on the 10V setting (not the 100V as shown).

1



Press the red test button. The reading should be between 10^6 to 10^9 . The reading below would be about 6×10^8 .

2

Next, remove the lead from one of the weights and attach the alligator clip as shown.

3

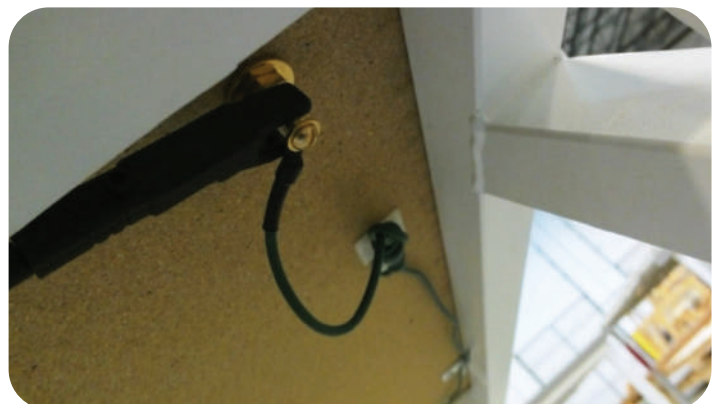


Attach the alligator clip to the ground stud under the top. You should still get the same reading as between the two weights on the surface. This verifies that the ground stud is conducting the electricity away from the top.

4

You should still get the same reading as between the two weights on the surface. This verifies that the ground stud is conducting the electricity away from the top.

5



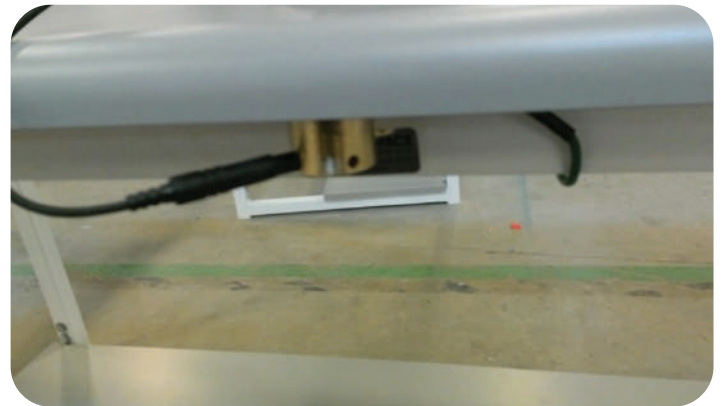


Next, remove the other lead from the weight on the table and plug it in to the ground hub on the front of the bench.

6

If you have used the correct ground wire from the kit you will see 1Mohm between the hub and lug. This ensures that the user connected through his wrist strap does not have a direct short to ground for safety purposes.

7



There are two ground wires included in an ESD kit. The longer wire is ALWAYS used between the ground hub and ground lug. It contains a 1Mohm resistor inline for safety purposes.

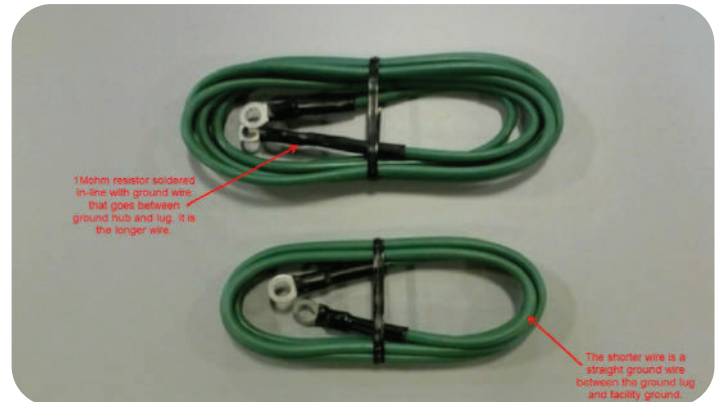
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The short ground wire must be routed between the ground lug and a facilities ground. Once connected you should be able to test for a dead short between the ground lug and facilities ground.

You should also be able to test from the surface to ground and get the 10^6 - 10^9 range.

If the table fails any of these three test you should troubleshoot immediately as your bench is not properly grounded.



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