



Total Solution in ESD Control
ESD Consultancy Sdn Bhd

TEST REPORT

Your Ref:
Our Ref: ESD/Test/2016-027
Date: 07/10/2016

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ESD Testing Centre TEST REPORT

Client Information

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Thiengvibulwong export@starflexile.com

Test Information

Test Date : 30/09/2016 to 7/10/2016
Specimen Submission Date : 29/09/2016

Type of Test/s: 1) ANSI/ESD S7.1-2005 Floor Materials

Type of Payment

Cheque ☐ _____ Mail ☐ _____ Electronic Transfer ☒ _____

Sample Description

No.	Product Name & Size	Product / Code	Qty
1	PVC Static Dissipative Floor Tile	Starflex ESD-7	6
	Size of the sample: 608mm X 608mm X 2.0mm		

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Total Solution in ESD Control
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ANSI/ESD S7.1-2005 TEST REPORT

1. Job Reference Number : ESD/Test/2016-027
2. Test Equipment Used :
 - 2.1 Trek Resistivity Meter Model 152-1 with selectable 10V & 100V
2 cylindrical ($2.27\text{kg} \pm 0.06\text{kg}$) electrodes with diameter (63.5 ± 0.25) mm as per ANSI/ESD S7.1-2005 specifications.
 - 2.2 Roline Humidity Transmitter (Environment Test Chamber)
3. Test Date : 04/10/2016 & 07/10/2016
4. Method of Test
 - 4.1 Floor Materials - Characterization of Materials ANSI/ESD S7.1-2005
 - 4.2 The six (6) test samples received were pre-conditioned to the following conditions :-

	Duration (hr)	Relative Humidity (%)	Temperature (°C)
1.	72	$12\% \pm 3\%$	$23^{\circ}\text{C} \pm 3^{\circ}\text{C}$
2.	72	$50\% \pm 3\%$	$23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

5. Test Setup

General View of the Sample

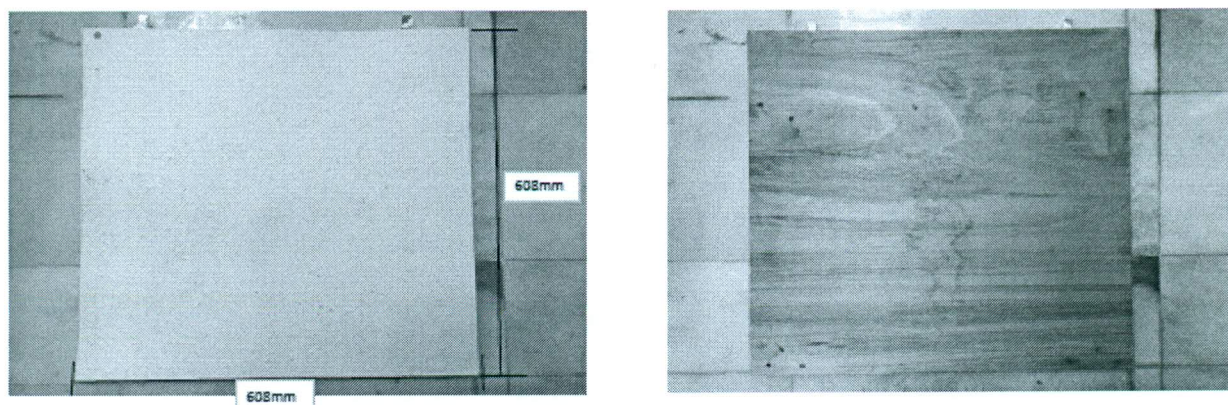


Figure 1



- 5.1 Six samples were received from customer.
- 5.2 All samples were visually inspected. No visual defect noted.
- 5.3 Each sample to be measured was identified as per follows :

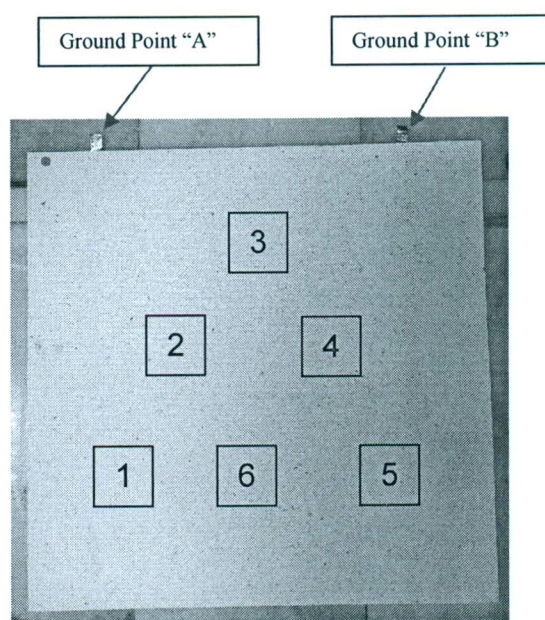


Figure 2

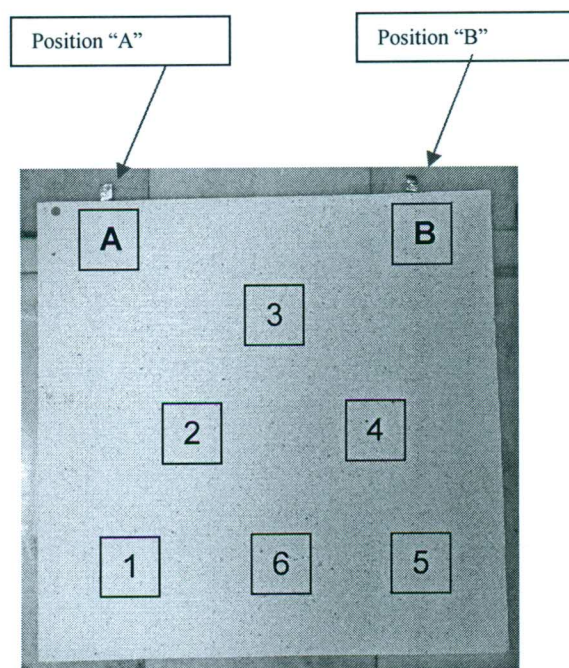


Figure 3

- 5.4 Samples were tested as per standard requirements of specified pre-conditioning.



6. Test Results

6.1 For Resistance to Groundable Point Measurements, six (6) readings were recorded at the designated points as show in figure 2 for six samples with point "A" grounded and relative humidity conditioned at 12% RH. The measurements were repeated for the same six (6) designated points but now with point "B" grounded. Electrification period for each reading was 15 seconds as per ANSI/ESD S7.1-2005.

6.2 Repeat step 6.1 with relative humidity conditioned to 50% RH.

a) At 12% RH

Test Temperature: 23°C ± 3°C

Test Humidity: 12% ± 3% RH

Test Voltage: 100 V

Sample	POINT "A" GROUNDED						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	9.80E+08	9.64E+08	8.21E+08	9.68E+08	9.45E+08	8.36E+08	8.21E+08	9.80E+08	9.19E+08	7.12E+07
B	5.52E+08	4.69E+08	4.66E+08	4.50E+08	5.50E+08	4.97E+08	4.50E+08	5.52E+08	4.97E+08	4.42E+07
C	8.88E+08	7.18E+08	7.78E+08	7.97E+08	9.29E+08	8.13E+08	7.18E+08	9.29E+08	8.21E+08	7.65E+07
D	6.56E+08	5.15E+08	4.72E+08	5.94E+08	6.46E+08	6.22E+08	4.72E+08	6.56E+08	5.84E+08	7.47E+07
E	9.09E+08	7.24E+08	7.60E+08	8.79E+08	8.72E+08	9.45E+08	7.24E+08	9.45E+08	8.48E+08	8.69E+07
F	5.95E+08	5.57E+08	5.07E+08	5.39E+08	6.38E+08	5.51E+08	5.07E+08	6.38E+08	5.65E+08	4.59E+07

Sample	POINT "B" GROUNDED						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	9.28E+08	9.34E+08	8.63E+08	8.41E+08	9.87E+08	9.76E+08	8.41E+08	9.87E+08	9.22E+08	5.89E+07
B	5.61E+08	4.35E+08	3.27E+08	3.33E+08	4.66E+08	4.69E+08	3.27E+08	5.61E+08	4.32E+08	8.94E+07
C	8.50E+08	8.29E+08	6.73E+08	6.84E+08	8.31E+08	8.65E+08	6.73E+08	8.65E+08	7.89E+08	8.64E+07
D	7.27E+08	6.42E+08	5.25E+08	5.72E+08	6.81E+08	6.41E+08	5.25E+08	7.27E+08	6.31E+08	7.30E+07
E	8.94E+08	9.50E+08	8.49E+08	8.90E+08	8.23E+08	8.65E+08	8.23E+08	9.50E+08	8.79E+08	4.39E+07
F	7.12E+08	6.26E+08	5.39E+08	5.53E+08	6.54E+08	6.27E+08	5.39E+08	7.12E+08	6.19E+08	6.44E+07



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ESD Consultancy Sdn Bhd

b) AT 50% RH

Test Temperature: $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

Test Humidity: $50\% \pm 3\% \text{ RH}$

Test Voltage: 100 V

Sample	POINT "A" GROUNDED						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	2.01E+07	1.56E+07	1.39E+07	1.96E+07	2.33E+07	2.05E+07	1.39E+07	2.33E+07	1.88E+07	3.46E+06
B	1.10E+07	1.18E+07	1.24E+07	1.42E+07	1.87E+07	1.61E+07	1.10E+07	1.87E+07	1.40E+07	2.93E+06
C	9.95E+07	8.54E+07	8.14E+07	8.67E+07	9.53E+07	9.07E+07	8.14E+07	9.95E+07	8.98E+07	6.70E+06
D	6.18E+07	6.24E+07	5.48E+07	5.13E+07	6.94E+07	5.92E+07	5.13E+07	6.94E+07	5.98E+07	6.33E+06
E	5.94E+07	5.96E+07	6.19E+07	5.79E+07	6.93E+07	6.02E+07	5.79E+07	6.93E+07	6.14E+07	4.09E+06
F	1.58E+07	1.79E+07	1.23E+07	1.26E+07	1.14E+07	1.02E+07	1.02E+07	1.79E+07	1.34E+07	2.90E+06
Support material	7.21E+08	6.22E+08	6.45E+08	6.57E+08	7.14E+08	6.81E+08	6.22E+08	7.21E+08	6.73E+08	3.92E+07

Sample	POINT "B" GROUNDED						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	2.37E+07	1.94E+07	1.46E+07	1.74E+07	2.33E+07	2.22E+07	1.46E+07	2.37E+07	2.01E+07	3.62E+06
B	1.19E+07	1.27E+07	1.15E+07	1.33E+07	1.01E+07	1.05E+07	1.01E+07	1.33E+07	1.17E+07	1.24E+06
C	9.74E+07	8.36E+07	8.88E+07	8.62E+07	9.76E+07	9.83E+07	8.36E+07	9.83E+07	9.20E+07	6.55E+06
D	6.83E+07	5.97E+07	6.44E+07	6.80E+07	5.03E+07	5.53E+07	5.03E+07	6.83E+07	6.10E+07	7.25E+06
E	6.50E+07	5.31E+07	5.89E+07	5.47E+07	6.13E+07	5.84E+07	5.31E+07	6.50E+07	5.86E+07	4.33E+06
F	1.91E+07	1.59E+07	1.30E+07	1.39E+07	1.81E+07	1.71E+07	1.30E+07	1.91E+07	1.62E+07	2.39E+06
Support material	7.42E+08	6.61E+08	5.91E+08	6.47E+08	6.60E+08	6.86E+08	5.91E+08	7.42E+08	6.65E+08	4.94E+07

6.3 For Resistance Point to Point Measurements, six (6) readings were recorded at the designated points as show in figure 3 for six samples with one Electrode placed at position "A" and relative humidity conditioned at 12% RH. The measurements were repeated for the same six (6) designated points but now with one Electrode placed at position "B". Electrification period for each reading was 15 seconds as per STM 7.1-2005.

6.4 Repeat step 6.3 with relative humidity conditioned to 50% RH.



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a) At 12% RH

Test Temperature: 23°C ± 3°C

Test Humidity: 12% ± 3% RH

Test Voltage: 100 V

Sample	POSITION "A"						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	7.34E+08	7.67E+08	7.75E+08	8.85E+08	8.46E+08	7.14E+08	7.14E+08	8.85E+08	7.87E+08	6.60E+07
B	9.53E+08	8.68E+08	8.91E+08	8.31E+08	9.58E+08	8.75E+08	8.31E+08	9.58E+08	8.96E+08	5.01E+07
C	5.99E+08	5.05E+08	5.68E+08	5.80E+08	6.05E+08	6.07E+08	5.05E+08	6.07E+08	5.77E+08	3.86E+07
D	4.68E+08	3.13E+08	3.17E+08	4.01E+08	4.92E+08	4.00E+08	3.13E+08	4.92E+08	3.99E+08	7.42E+07
E	5.89E+08	5.24E+08	4.77E+08	6.22E+08	6.02E+08	6.65E+08	4.77E+08	6.65E+08	5.80E+08	6.83E+07
F	4.35E+08	2.94E+08	2.91E+08	3.51E+08	4.44E+08	3.83E+08	2.91E+08	4.44E+08	3.66E+08	6.66E+07

Sample	POSITION "B"						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	8.49E+08	8.43E+08	7.83E+08	7.87E+08	7.61E+08	7.07E+08	7.07E+08	8.49E+08	7.88E+08	5.30E+07
B	8.83E+08	7.81E+08	7.94E+08	7.14E+08	8.44E+08	7.93E+08	7.14E+08	8.83E+08	8.02E+08	5.77E+07
C	4.23E+08	5.19E+08	4.83E+08	4.21E+08	5.63E+08	5.38E+08	4.21E+08	5.63E+08	4.91E+08	5.96E+07
D	5.55E+08	4.34E+08	4.06E+08	4.30E+08	4.91E+08	4.42E+08	4.06E+08	5.55E+08	4.60E+08	5.44E+07
E	8.75E+08	7.09E+08	7.34E+08	8.50E+08	7.80E+08	7.42E+08	7.09E+08	8.75E+08	7.82E+08	6.71E+07
F	4.68E+08	3.62E+08	3.73E+08	3.40E+08	3.67E+08	3.55E+08	3.40E+08	4.68E+08	3.78E+08	4.58E+07

b) At 50% RH

Test Temperature: 23°C ± 3°C

Test Humidity: 50% ± 3% RH

Test Voltage: 100 V

Sample	POSITION "A"						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	1.60E+07	1.24E+07	1.04E+07	1.59E+07	2.03E+07	1.67E+07	1.04E+07	2.03E+07	1.53E+07	3.47E+06
B	1.31E+07	1.06E+07	1.29E+07	1.22E+07	1.54E+07	1.29E+07	1.06E+07	1.54E+07	1.29E+07	1.55E+06
C	3.91E+07	3.10E+07	4.02E+07	3.44E+07	3.15E+07	3.23E+07	3.10E+07	4.02E+07	3.48E+07	3.98E+06
D	6.42E+07	6.47E+07	5.52E+07	5.09E+07	6.61E+07	5.73E+07	5.09E+07	6.61E+07	5.97E+07	6.16E+06
E	3.16E+07	3.04E+07	3.80E+07	3.10E+07	4.27E+07	3.58E+07	3.04E+07	4.27E+07	3.49E+07	4.85E+06
F	1.14E+07	1.36E+07	1.27E+07	1.19E+07	1.01E+07	1.06E+07	1.01E+07	1.36E+07	1.17E+07	1.30E+06
Support material	3.18E+08	2.48E+08	2.51E+08	2.56E+08	2.68E+08	2.66E+08	2.48E+08	3.18E+08	2.68E+08	2.58E+07

Sample	POSITION "B"						Min	Max	Average	Std. Dev
	1	2	3	4	5	6				
A	1.86E+07	1.61E+07	1.18E+07	1.28E+07	1.81E+07	1.74E+07	1.18E+07	1.86E+07	1.58E+07	2.86E+06
B	1.57E+07	1.16E+07	1.08E+07	1.45E+07	1.43E+07	1.30E+07	1.08E+07	1.57E+07	1.33E+07	1.87E+06
C	8.73E+07	7.78E+07	7.97E+07	7.06E+07	7.85E+07	6.97E+07	6.97E+07	8.73E+07	7.73E+07	6.48E+06
D	3.11E+07	4.47E+07	3.92E+07	3.47E+07	4.60E+07	4.11E+07	3.11E+07	4.60E+07	3.95E+07	5.75E+06
E	4.12E+07	3.89E+07	2.73E+07	2.12E+07	3.79E+07	3.77E+07	2.12E+07	4.12E+07	3.40E+07	7.92E+06
F	1.35E+07	1.24E+07	1.17E+07	1.24E+07	1.02E+07	1.08E+07	1.02E+07	1.35E+07	1.18E+07	1.20E+06
Support material	2.98E+08	2.25E+08	2.17E+08	2.06E+08	2.34E+08	2.36E+08	2.06E+08	2.98E+08	2.36E+08	3.23E+07



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7. **Conclusion**

The readings obtained from all the samples range are within the range of 10^7 to 10^8 Ohms.

Therefore the products classified dissipative materials.



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