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SAMPLE ESD STUDY FOR STATIC CONTROL FLOOR

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Date

Client

Attention: Client

RE: ESD Floor Testing

On (date) we performed testing to determine the resistive characterization of static control on the floor of room ### (new Mass Spectrometer room) of the building at Street, Ottawa.

Measurement Instruments

Performance testing of the floor resistance was carried out using calibrated ESD test measurement equipment, consisting of the following:

- Metermaster MEGGER megohmmeter Type BM8.Mk2 (see calibration certificate attached)
- Surface Resistance Probes
- High voltage connecting cables and grounding clip

Measurement Procedure

Testing was performed according to the ANSI/EOS/ESD Standard 7.1 entitled “Floor Materials – Resistive Characterization of Materials”.

The first series of data were collected using the “Test Procedure for Resistance to Ground” of Standard 7.1. The second series of data was collected according to the “Test Procedure for Resistance Point to Point” of Standard 7.1. All measurement points situated on the test floor were cleaned with isopropyl alcohol prior to taking instrument readings. The surface resistance probes were also cleaned prior to testing. Battery tests and continuity tests were conducted in the instrument prior to recording test data. Test voltage was applied and resistance recorded after the instrument stabilized, approximately 30 seconds.

For point to point resistance testing, the probes were placed 3 feet (914 mm) apart.

Measurement Results

In the following data table we present the results of our measurements as taken on between 10:30 am and 12:30 pm. The measurement values appear in 1×10^6 ohms for each position.

Static control products are classified as being either conductive when the RTG (Resistance To Ground) value is between 2.5×10^4 to 1×10^6 ohms or static-dissipative when the RTG is between 1×10^6 to 1×10^9 ohms.

TEST DATA: (Please reference the attached floor plan drawings for the associated test locations)

Temp (C) 23 deg
RH 33%

Site

Test Location	RTG in 1×10^6 ohms	ESD Ground Point Used	Point to Point in 1×10^6 ohms
1	13	G1	10
2	3.6	G1	10
3	1.6	G1	30
4	6	G2	18
5	7.6	G2	10
6	10	G2	18
7	0.4	G2	24
8	4	G2	6
9	4	G2	
10	7.6	G2	
11	4	G2	
12	9	G2	
13	2.4	G2	
14	2.2	G2	
15	18	G2	

Conclusions

The static control flooring material installed in room Ottawa consisted of 12 inch by 12 inch tiles cemented to the floor substrate and grounded by copper straps to the building ground.

The resistance to ground (RTG) testing data shows that the floor is static-dissipative as the values obtained are between 1×10^6 and 1×10^9 ohms, with the exception of test point 7. Test point 7 is in close proximity to the floor ground G2 and we recorded a reading of 4×10^5 ohms. It is possible that during installation the floor section at this location included a greater amount of underlying copper straps and/or conductive adhesive. This could create a small area where the floor is classified as conductive as opposed to static-dissipative.

The point to point testing data shows that the floor is static-dissipative with values obtained between 1×10^6 and 1×10^9 ohms.


All static control flooring materials must be installed in accordance to strict manufacturer guidelines for the material to perform as per specifications. Also, the surface on which the flooring material is installed must be level and free of any irregularities that may interfere with the contact of the floor material and the conductive adhesive used to cement the individual tiles to the substrate. Grounding copper straps, installed prior to cementing the floor must also be installed properly and configured to give an equipotential dissipation of static charge. The ground or grounds for the floor material should be installed as per the guidelines in ANSI/EOS/ESD Standard 6.1 "For Protection Of Electrostatic Discharge Susceptible Items – Grounding – Recommended Practice".

The manufacturer of the flooring material should be consulted to determine if the test results are within their specified range for the dissipation of static charge.

Should you have any questions regarding these matters, please do not hesitate to contact me.

Sincerely,

Marc A. Belanger, P.Eng.
President
PowerCET Canada
Better Technologies Corporation

PYLON ELECTRONICS INC. 147 Colonnade Road, Ottawa, ON K2E 7L9		www.pylonelectronics.com			
CERTIFICATE OF CALIBRATION					
Page 1 of 1					
Purchase Order	MICHEL FORTIER	Customer Name	FORAM INDUSTRIES		
Work Order	D68937	Instrument Id	N/A		
Model Number	BM8	Cal Procedure	SEE TEST DATA SHEET		
Serial Number	2172894	Cal Date	27 Oct 2003		
Description	INSULATION TESTER	Recall Cycle	52 Weeks		
Manufacturer	MEGGER	Next Cal Date	27 Oct 2004		


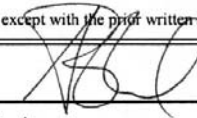

Received Condition : Within Tolerance
 Completed Condition : Full Calibration
 Environmental Conditions : Lab Temperature 22°C Lab Relative Humidity 42%

STANDARDS USED TO ESTABLISH TRACEABILITY		
Instrument Type	Model	Asset #
RESISTOR BOX, FOR MEGGER CALIBRATION	R19100G	240-638
DECADE RESISTOR, 12 MOHM MAX	DB 877	354-712

Pylon certifies that, at the time of calibration, the above listed instrument meets or exceeds all of the specifications defined in the calibration procedure(s) or specification(s) referenced on the TDS. The received and final conditions specified above and the TDS specifications are based on the procedure referenced on the TDS unless otherwise indicated. The above listed instrument has been calibrated using standards whose calibrations are traceable to the National Research Council of Canada (NRC), the National Institute of Standards and Technology (NIST) and/or other recognised international standards. Unless otherwise specified, Pylon maintains a minimum of a 4:1 ratio between the equipment under test and the measurement system.

Pylon's Electrical and Physical Properties Laboratories meet the requirements of D-QA-001-002/SF-001 for ambient temperature, relative humidity and cleanliness. Equipment is maintained by procedures that meet the requirements of ISO 9000 and ISO 10012-1.

This report consists of 2 parts with separate page numbering schemes; the Certificate of Calibration and the Test Data Sheet(s) (TDS). Copyright of this report is owned by the issuing laboratory and may not be reproduced, other than in full, except with the prior written approval of the issuing laboratory.

 Metrologist : K. Rioux	 Quality Assurance	 Date 27-Oct-03
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