MET Laboratories, Inc. ***Safety Certification - EMI - Telecom Environmental Simulation***
914 WEST PATAPSCO AVENUE ! BALTIMORE, MARYLAND 21230-3432 ! PHONE (410) 354-3300 ! FAX (410) 354-3313

November 14, 2018

LG Electronics, Inc
LG Twin Tower, 128 Yeoui-daero
Seoul, Korea of Republic

Dear Seungjee Lee,

Enclosed are the test data and photographs obtained from the testing of the LG Electronics, Inc, LG G7 Fit was subjected to Environmental Simulation Testing in accordance with MET Quote Number 2LGE1001, and LG Electronics, Inc Order Number LGE_STD180813.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Michelle Tawmging

Michelle Tawmging
Documentation Department

Reference: (\LG Electronics, Inc\ESL101350-MIL)

DOC-ESL 1604 2/26/2004

ACCREDITED
TESTING CERT #0591.01

Environmental Simulation Testing

for the
LG Electronics, Inc
LG G7 Fit

Tested Under
Customer Order #LGE_STD180813, MIL-STD 810G

MET Report: ESL101350-MIL

November 14, 2018

Prepared For:
LG Electronics, Inc
LG Twin Tower, 128 Yeoui-daero
Seoul, Korea of Republic

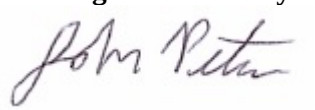
Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Avenue
Baltimore, Maryland 21230

Test Report
for the

LG Electronics, Inc
LG G7 Fit

Tested Under
Customer Order #LGE_STD180813
and
MIL-STD 810G

Testing Performed By:

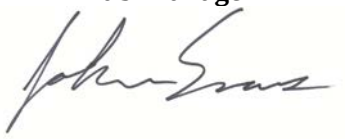


John Peters
Test Engineer

Report Prepared By:

Michelle Tawmging
Documentation Department

Lab Manager



Johnnie Evans
Manager, Environmental Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	November 14, 2018	Initial Issue

Table of Contents

List of Charts

List of Figures

List of Photographs

Executive Summary

MET Laboratories, Inc. was contracted by LG Electronics, Inc to perform acceptance testing to MIL-STD-810G criteria on the LG G7 Fit under the LG Electronics, Inc purchase order number LGE_STD181001.

The tests were based on MIL-STD-810G and Customer Order #LGE_STD180813

The results obtained relate only to the item(s) tested.

Altitude Test Methods

Procedure II – Operation

The EUT was subjected to an Altitude test in accordance with the procedures of MIL-STD-810G, Method 500.5, Procedure II. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Altitude Requirements of MIL-STD-810G, Method 500.5, Procedure II.

High Temperature Test Methods

The EUT was subjected to a High Temperature test in accordance with the procedures of MIL-STD-810G, Method 501.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the High Temperature Requirements of MIL-STD-810G, Method 501.5.

Low Temperature Test Methods

The EUT was subjected to a Low Temperature test in accordance with the procedures of MIL-STD-810G, Method 502.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Low Temperature Requirements of MIL-STD-810G, Method 502.5.

Temperature Shock Test Methods

The EUT was subjected to a Temperature Shock test in accordance with the procedures of MIL-STD-810G, Method 503.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Temperature Shock Requirements of MIL-STD-810G, Method 503.5.

Solar Radiation (Sunshine) Test Methods

The EUT was subjected to a Solar Radiation (Sunshine) test in accordance with the procedures of MIL-STD-810G, Method 505.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Solar Radiation (Sunshine) Requirements of MIL-STD-810G, Method 505.5.

Rain Test Methods

The EUT was subjected to a Rain test in accordance with the procedures of MIL-STD-810G, Method 506.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Rain Requirements of MIL-STD-810G, Method 506.5.

Humidity Test Methods

The EUT was subjected to a Humidity test in accordance with the procedures of MIL-STD-810G, Method 507.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Humidity Requirements of MIL-STD-810G, Method 507.5.

Salt Fog Test Methods

The EUT was subjected to a Salt Fog test in accordance with the procedures of MIL-STD-810G, Method 509.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Salt Fog Requirements of MIL-STD-810G, Method 509.5.

Sand and Dust Test Methods

The EUT was subjected to a Sand and Dust test in accordance with the procedures of MIL-STD-810G, Method 510.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Sand and Dust Requirements of MIL-STD-810G, Method 510.5.

Immersion Test Methods

The EUT was subjected to an Immersion test in accordance with the procedures of MIL-STD-810G, Method 512.5. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Immersion Requirements of MIL-STD-810G, Method 512.5.

Vibration Test Methods

The EUT was subjected to a Vibration Contents test in accordance with the procedures of MIL-STD-810G, Method 514.6. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Vibration Contents Requirements of MIL-STD-810G, Method 514.6.

Shock Test Methods

The EUT was subjected to a Shock test in accordance with the procedures of MIL-STD-810G, Method 516.6. The EUT was **compliant** to this requirement. No anomalies were observed. The EUT **conforms** to the Shock Requirements of MIL-STD-810G, Method 516.6.

Equipment Configuration

A. Overview

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform an Acceptance Test of the LG Electronics, Inc, LG G7 Fit. The tests were based on MIL-STD-810G. The tests described in this document were formal tests as described in MIL-STD 810G. The objective of the testing was to verify compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications.

Model(s) Tested:	LG G7 Fit	
Model(s) Covered:	LG G7 Fit, LG Q9	
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	**Temperature:**	15-35º C
	Relative Humidity:	30-60%
	Barometric Pressure:	860-1060 mbar
Evaluated by:	John Peters	
Date:	November 14, 2018	

B. References

ISO 1012-1: 1992 (E)	Quality Assurance Requirements for Measuring Equipment
MIL-STD-810G	Environmental Conditions and Test Procedures for Airborne Equipment
MIL-STD 810G	Environmental Test Methods and Engineering Guidelines
SR-3580	Bellcore Special Report, Network Equipment-Building System (NEBS) Criteria Levels

C. Test Site

All testing was performed in a limited access test laboratory. This facility is located at MET Laboratories, Inc., 914 W. Patapsco Avenue, Baltimore, Maryland 21230.

This testing was conducted in the Environmental Simulation Lab at MET Laboratories, Inc. All equipment used in making physical determinations is accurate and bears recent traceability to the National Standards and Technology.

D. Modifications

a) Modifications to the EUT

No modifications to the EUT were required.

b) Modifications to the Test Standard

No modifications to the Test Standard were necessary.

E. Disposition of EUT

The test sample including all support equipment (if any), submitted to the Environmental Simulation Lab for testing was returned to LG Electronics, Inc upon completion of testing.

Method 500.5 Low Pressure (Altitude)

A. Low Pressure (Altitude), Procedure II - Operation (MIL-STD-810G, Method 500.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the low pressure altitude test as described in MIL-STD-810G Method 500.5, Procedure II.

Test Procedure:

A. The EUT was installed in the altitude chamber. The cables required for the operation and monitoring of the EUT were attached. The proper operation of the EUT was verified.

B. The internal chamber temperature was maintained at 25°C.

C. The chamber air pressure to was adjusted to 57.2 kPa or 8.3 psia to correspond to the required test altitude of 4,572m (15,000 ft), at a change rate that did not exceed 10 m/s.

D. The test altitude was maintained for 1 hour while the EUT was functionally evaluated.

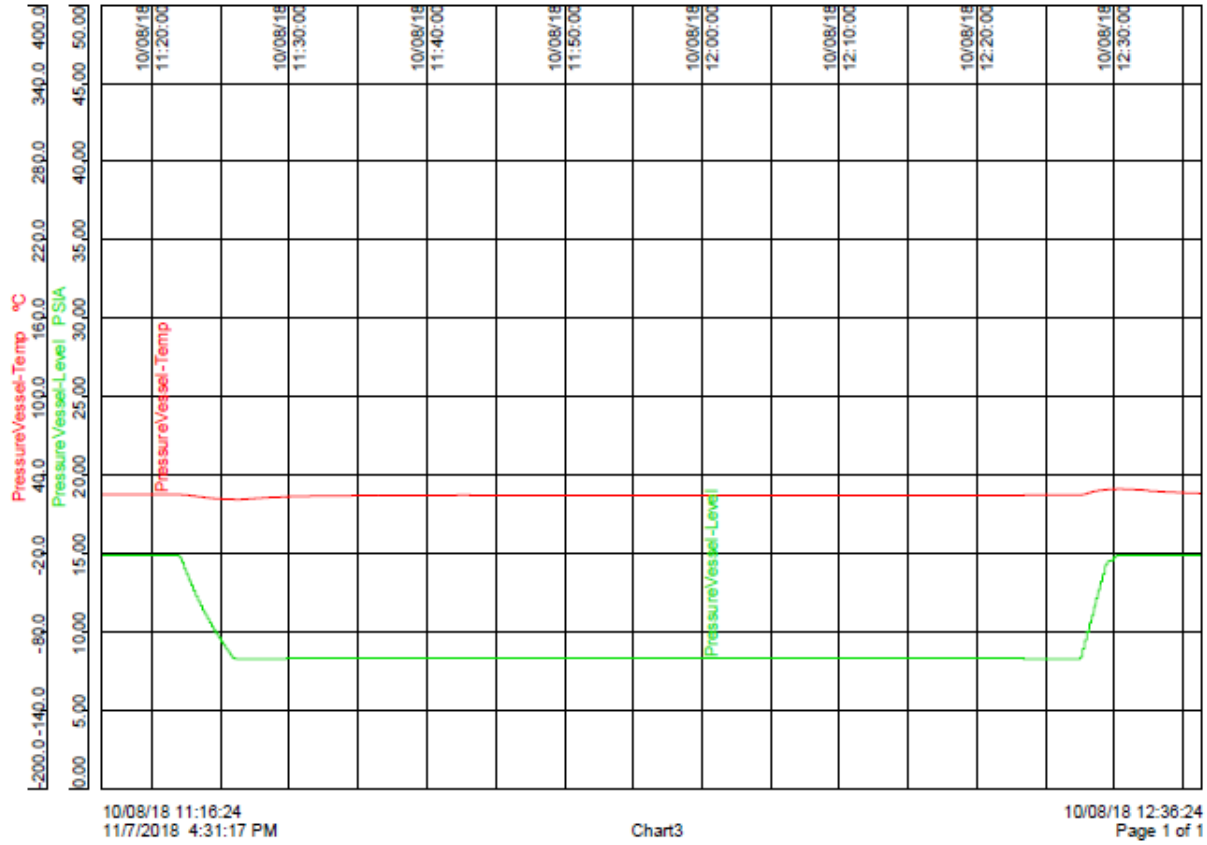
E. The chamber air was adjusted to standard ambient conditions at a change rate of 10 m/s.

F. The EUT was visually inspected and functionally verified.

Test Results: The EUT was **compliant** with the requirements of Low Pressure (Altitude), Procedure II Operation. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 8, 2018



Method 501.5 High Temperature

A. High Temperature, Procedure I - Storage (MIL-STD-810G, Method 501.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the High Temperature test as described in MIL-STD-810G Method 501.5, Procedure I.

Test Procedure:

A. The EUT was placed in the chamber in its storage configuration.

B. The chamber environment was adjusted to 63 °C for the start of the test period and maintained for the specified time following temperature stabilization of the EUT.

C. The test temperature was maintained at least two hours following EUT temperature stabilization (see Part One, paragraph 5.5).

D. At the completion of the constant temperature soak or the last cycle, the chamber air temperature was adjusted to standard ambient conditions and maintained until the EUT temperature was stabilized.

E. A visual examination and operational checkout were conducted on the EUT and results were recorded for comparison with pretest data.

Test Results: The EUT was **compliant** with High Temperature, Procedure I - Storage. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 9 and 10, 2018

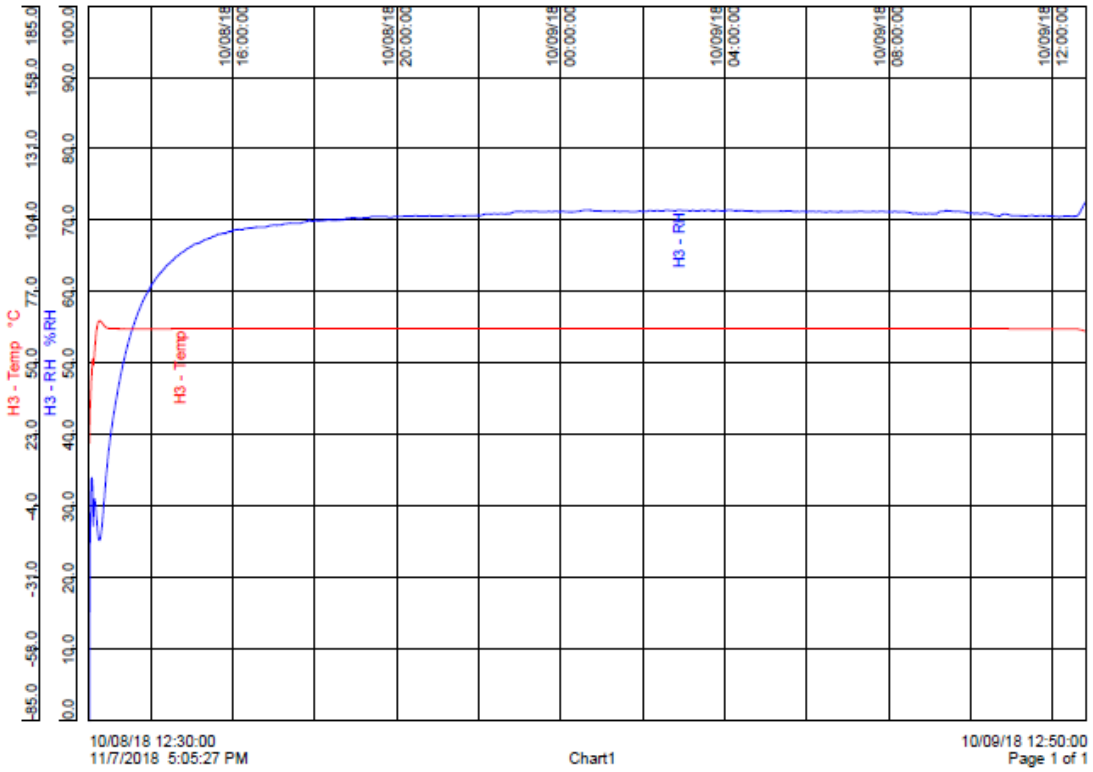
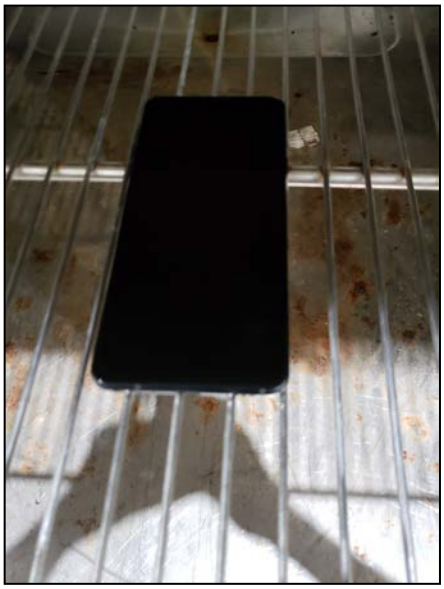


Chart 1. High Temperature, Procedure I – Storage, Test Results



Photograph 1. High Temperature, Procedure I – Storage, Test Setup

B. High Temperature, Procedure II - Operation (MIL-STD-810G, Method 501.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the High Temperature test as described in MIL-STD-810G Method 501.5, Procedure II.

Test Procedure:

A. The EUT functionality was evaluated at ambient temperature and humidity level (25°C +/-5°C, 55%RH).

B. With the EUT placed in the chamber in its operational configuration, any additional temperature sensors necessary were installed to measure the maximum temperature response of the EUT, ensuring the functioning components are included.

C. The chamber air conditions were adjusted to the required steady state temperature of 43°C.

D. The chamber conditions were maintained for at least two hours following the EUTs temperature stabilization.

E. A visual examination and functional verification of the EUT was performed and the results were documented for comparison with pretest data.

Test Results: The EUT was **compliant** with High Temperature, Procedure II - Operational. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 9 and 10, 2018

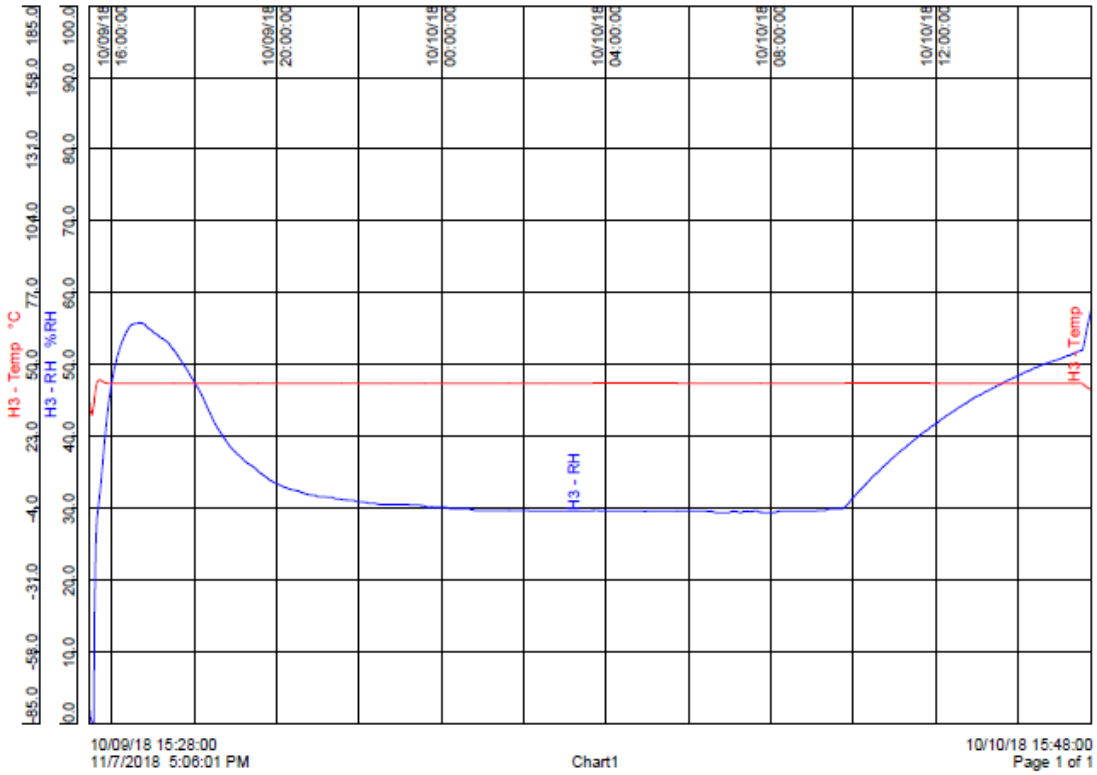
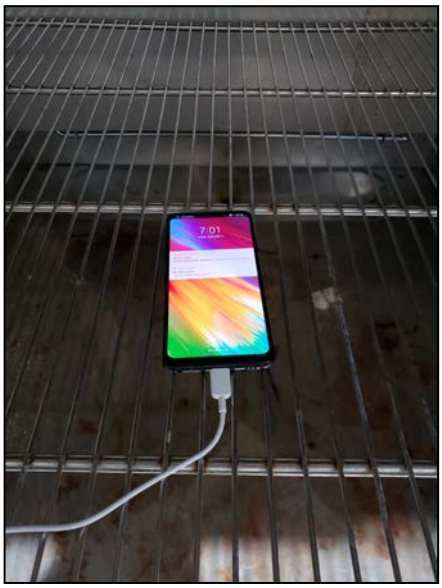


Chart 2. High Temperature, Procedure II – Operation, Test Results



Photograph 2. High Temperature, Procedure II – Operation, Test Setup

Method 502.5 Low Temperature

A. Low Temperature, Procedure I - Storage (MIL-STD-810G, Method 502.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the Low Temperature test as described in MIL-STD-810G Method 502.5, Procedure I.

Test Procedure:

A. The EUT functionality was evaluated at ambient temperature and humidity level (25°C +/-5°C, 55%RH).

B. With the EUT non-operating, the chamber temperature was decreased to -33°C.

C. The chamber temperature was held at -33°C for 24 hours.

D. At the conclusion of the test, the chamber temperature was increased to ambient conditions.

E. The EUT functionality was evaluated at ambient temperature and humidity level (25°C, 55%RH).

Test Results: The EUT was **compliant** with Low Temperature, Procedure I – Storage. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 10 and 11, 2018

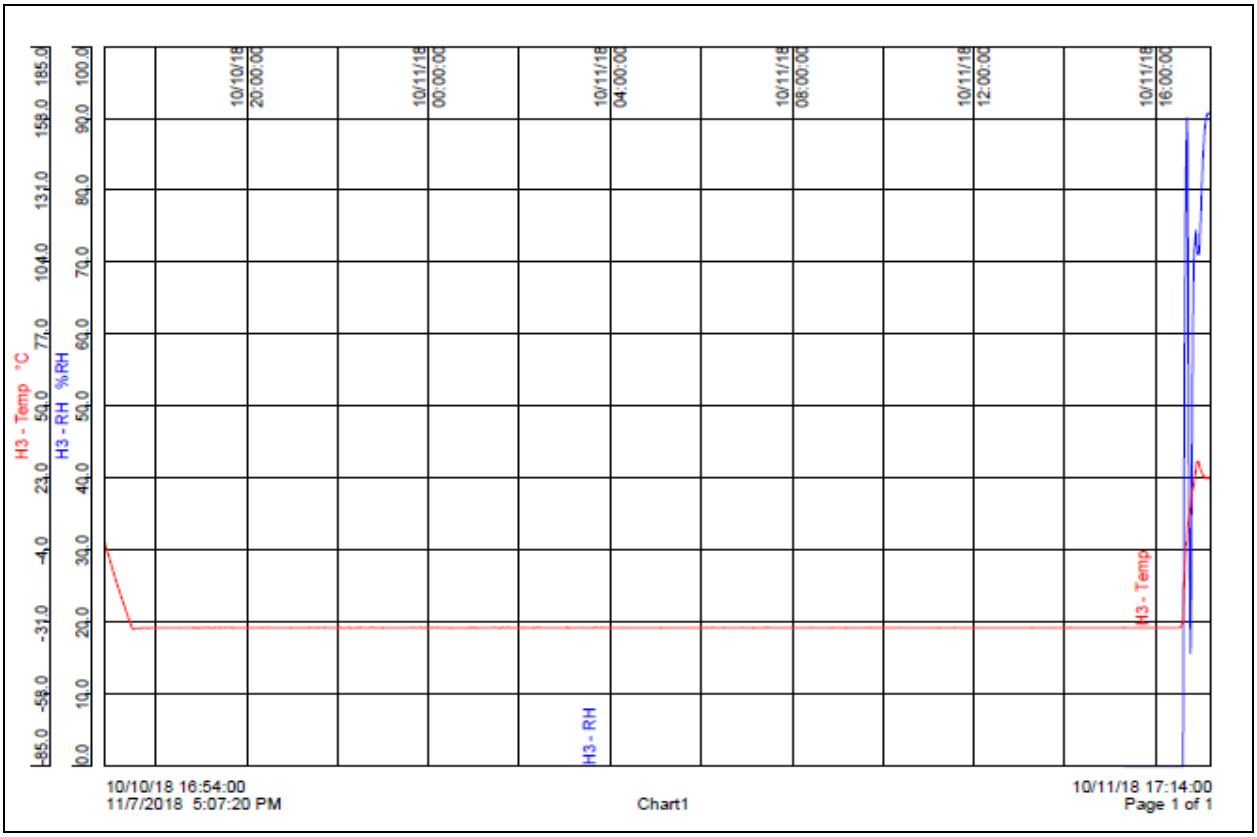
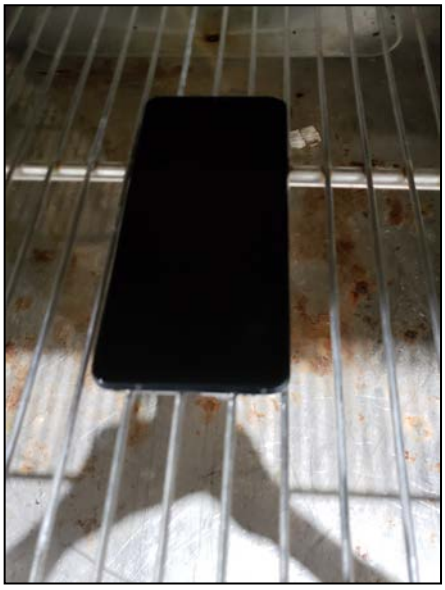


Chart 3. Low Temperature, Procedure I – Storage, Test Results



Photograph 3. Low Temperature, Procedure I – Storage, Test Setup

B. Low Temperature, Procedure II - Operation (MIL-STD-810G, Method 502.5

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the low temperature test as described in MIL-STD-810G Method 502.5, Procedure II.

Test Procedure:

A. The operational EUT was installed in the test chamber and the chamber air temperature was adjusted to -21°C.

B. This temperature was maintained for at least two hours following the temperature stabilization of the EUT.

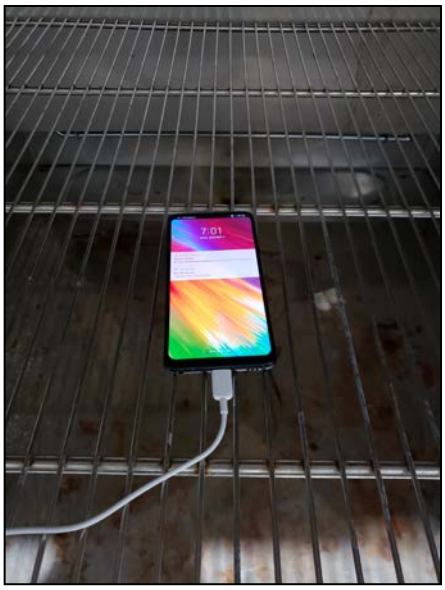
C. The EUT was visually inspected.

D. The chamber air temperature was adjusted to standard ambient and maintained until temperature stabilization of the EUT was achieved.

Test Results: The EUT was **compliant** with Low Temperature, Procedure II - Operational. No anomalies were observed. Chamber was monitored manualy during test.

Test Engineer: John Peters

Test Date: October 12, 2018



Photograph 4. Low Temperature, Procedure II – Operation, Test Setup

Method 503.5 Temperature Shock

A. Temperature Shock, Procedure I-C – Multi-Cycle Shocks

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance during its operating life when operated within the conditions of MIL-STD-810G, Method 503.5, Procedure I-C – Multi-Cycle Shocks.

Test Procedure:

A. The EUT was placed in the chamber and subjected to a temperature shock in **Figure 1**. The temperature was maintained for a period of 1 hours. The EUT was allowed to stabilize.

B. The EUT temperature was increased to 43°C in no more than one minute. This temperature was maintained for a period of 2 hours. The EUT was allowed to stabilize.

C. The temperature was changed to -21°C in no more than one minute. This temperature was maintained for a period of 2 hours. The EUT was allowed to stabilize.

D. The chamber temperature was cycled for a total of 3 cycles.

E. The EUT was returned to standard ambient conditions after the final cycle.

F. The EUT was visually inspected and functionally evaluated.

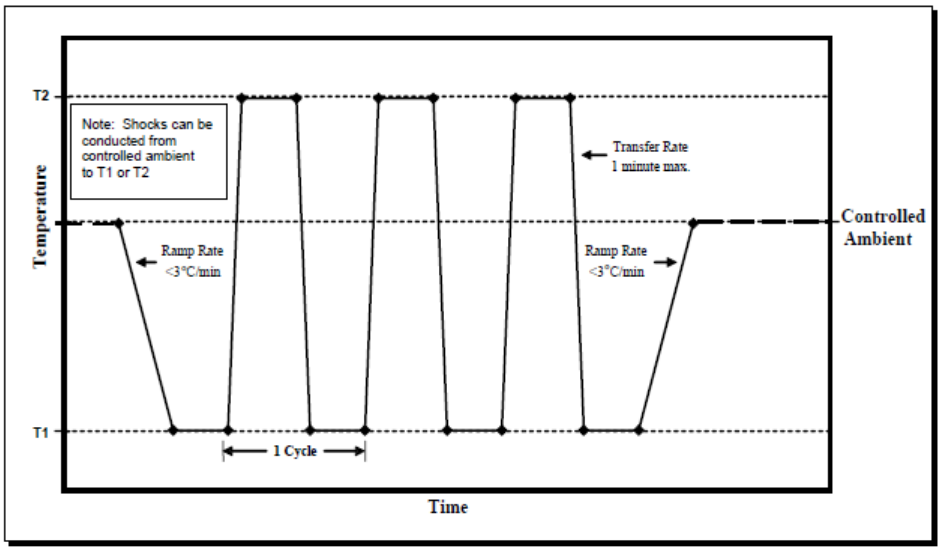


Figure 503.5-3. Multi-cycle shocks.

Figure 1. Method 503.5, Procedure I-C – Multi-Cycle Shocks

Test Results: The EUT was **compliant** with Temperature Shock, Procedure I-C. No anomalies were observed. Test was monitored manually

Test Engineer: John Peters

Test Date: October 16, 2018

Photograph 5. Temperature Shock, Procedure I-C – Multi-Cycle Shocks, Test Setup

Method 505.5 Solar Radiation (Sunshine)

A. Solar Radiation (Sunshine), Procedure I, Cycling (MIL-STD-810G, Method 505.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the contamination by fluids test as described in MIL-STD-810G Method 505.5, Procedure I.

Test Procedure:

A. The chamber air temperature was adjusted to the minimum value of the temperature cycle at which radiation was nonexistent.

VALUES ARE FROM STANAG 2895 - Temperatures of categories A1, A2 and A3 in °C; solar radiation in W/m²

A1	35	34	34	33	33	32	33	35	38	41	43	44	47	48	48	49	48	48	46	42	41	39	38	37
A2	33	32	32	31	30	30	31	34	37	39	41	42	43	44	44	44	43	42	40	38	36	35	34	33
A3	30	29	29	28	28	28	29	30	31	34	36	37	38	38	39	39	38	37	35	34	34	32	32	31
W	0	0	0	0	0	55	270	505	730	915	1040	1120	1120	1040	915	730	505	270	55	0	0	0	0	0

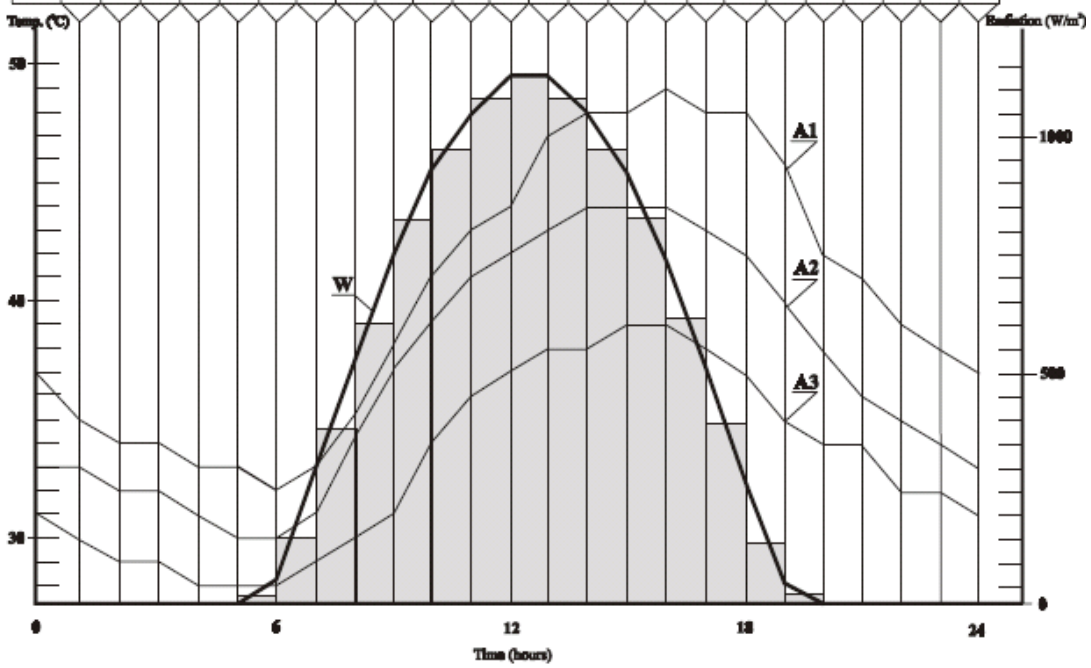


FIGURE 505.4-1. Procedure 1 - Cycling Test.

B. The EUT was exposed to continuous 24-hour cycles of controlled simulated solar radiation and dry bulb temperature as indicated on figure 505.5-1.
a) Three continuous cycles

C. The EUT **was not** operated throughout the test.

D. The chamber air temperature was adjusted to standard ambient conditions and maintained until temperature stabilization of the EUT was achieved.

E. The EUT was visually inspected.

F. The EUT was functionally verified.

Test Results:	The EUT was **compliant** with Solar Radiation, Procedure I. No anomalies were observed.
Test Engineer:	John Peters
Test Date:	October 15-18, 2018

Photograph 6. Solar Radiation (Sunshine), Procedure I, Cycling, Test Setup

Method 506.5 Rain

A. Rain, Procedure III, Drip (MIL-STD-810G, Method 506.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance as a result of being exposed to the rain test as described in MIL-STD-810G Method 506.5, Procedure III.

Test Procedure:

A. The EUT was installed in its operational configuration. The temperature differential between the EUT and the water was ensured to be 10°C or greater.

B. With the EUT operating, it was subjected to water falling from a height no less than 1 meter (3 feet) for 15 minutes.

C. At the conclusion of the 15-minute exposure, the EUT was removed.

D. The EUT was visually inspected for evidence of water ingress.

E. The EUT was functionally verified.

Test Results: The EUT was **compliant** with Rain, Procedure III. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 12, 2018

Photograph 7. Rain, Procedure III, Drip, Test Setup

Method 507.5 Humidity

A. Humidity (MIL-STD-810G, Method 507.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G, Method 507.5.

Test Procedure:

A. The EUT functionality was evaluated at ambient temperature and humidity levels (25°C ± 5°C, 55%RH).

B. The operational EUT was installed in the temperature chamber at 25°C (± 5°C) and a relative humidity between 20 and 55%.

C. The EUT was subjected to the environment described in the table and figure on the next page, and as detailed in Steps D through H.

D. The chamber temperature and relative humidity were increased to 31°C and 88% RH.

E. The chamber temperature and relative humidity were increase to follow the profile shown in Figure 2.

F. Step D and E were repeated fifteen (15) times for a total of sixteen (16) 24 hour cycles.

G. At the conclusion of the sixteenth cycle, the chamber and humidity were decreased to ambient conditions.

H. The EUT functionality was evaluated at ambient temperature and humidity levels (25°C, 55%RH).

Procedure I – Induced Storage/Transit, Natural and Cycle Profiles

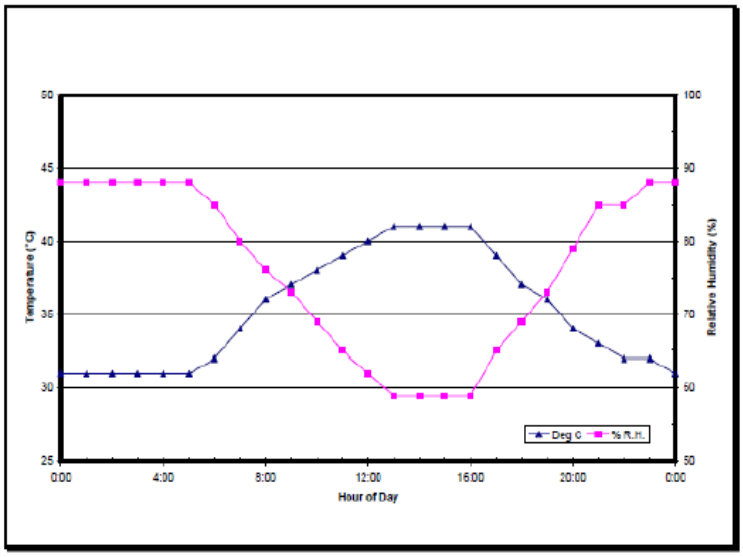


Figure 507.5-6. Natural Cycle B3 - Hot humid.

Table 507.5-VIII. Hot Humid – Natural Cycle B3.

Time	Temp.		RH	Time	Temp.		RH
	°F	°C	%		°F	°C	%
0000	88	31	88	1300	105	41	59
0100	88	31	88	1400	105	41	59
0200	88	31	88	1500	105	41	59
0300	88	31	88	1600	105	41	59
0400	88	31	88	1700	102	39	65
0500	88	31	88	1800	99	37	69
0600	90	32	85	1900	97	36	73
0700	93	34	80	2000	94	34	79
0800	96	36	76	2100	91	33	85
0900	98	37	73	2200	90	32	85
1000	100	38	69	2300	89	32	88
1100	102	39	65	2400	88	31	88
1200	104	40	62				

Figure 2. Humidity –Natural Cycle B3

Test Results: The EUT was **compliant** with Humidity. No anomalies were observed. Testing was monitored throughout the duration of the test. Due to a network issue data was lost from the 12th to the 16th.

Test Engineer: John Peters

Test Date: October 11 – October 25, 2018

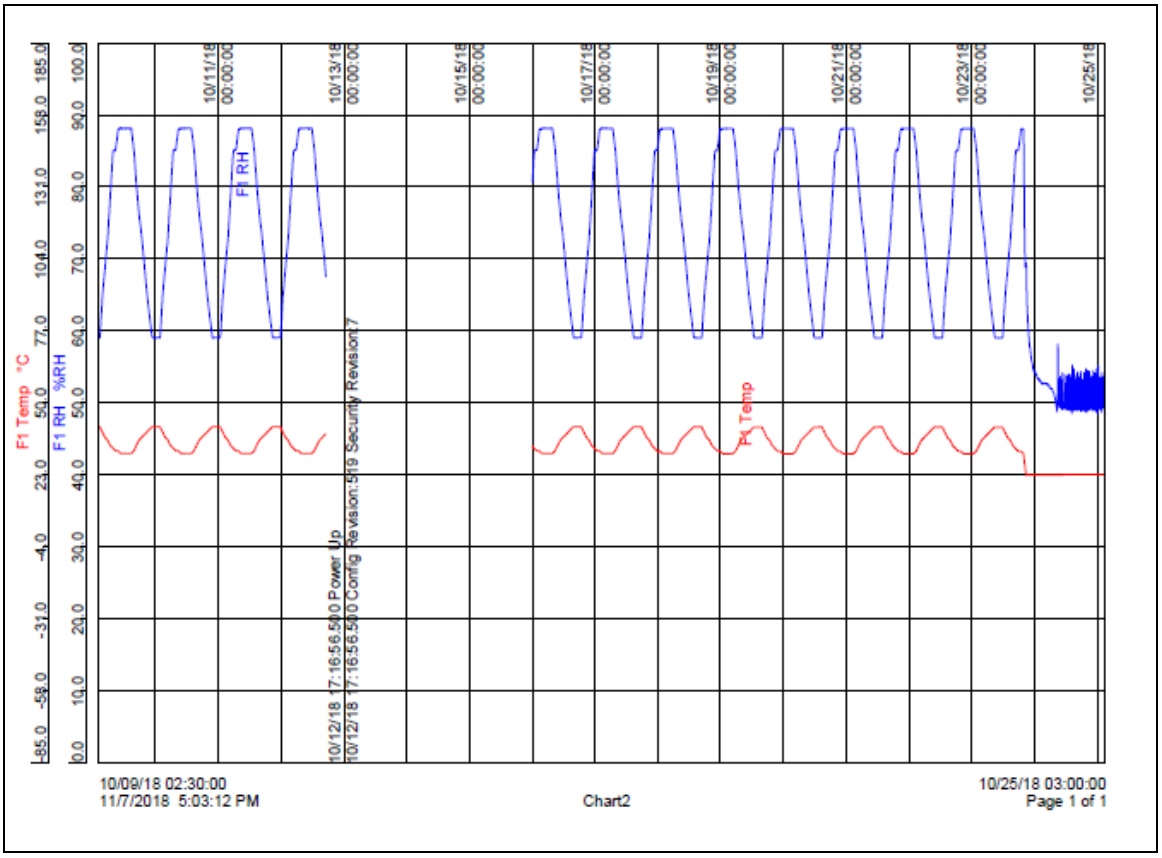
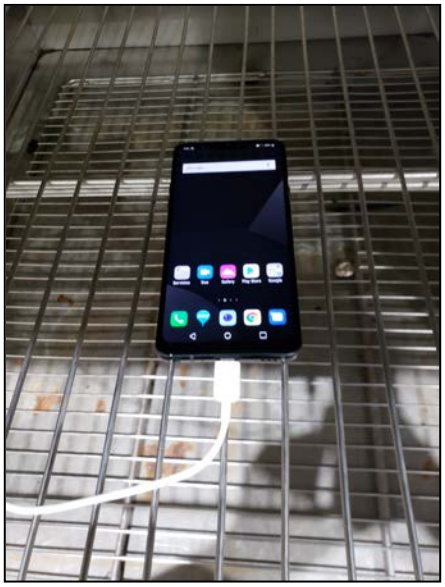


Chart 4. Humidity, Test Results



Photograph 8. Humidity, Test Setup

Method 509.5 Salt Fog

A. Salt Fog (MIL-STD-810G, Method 509.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G, Method 509.5.

Test Procedure:

A. A functional test of the EUT was performed.

B. A 5 +/- 1% (by weight) non-iodized salt solution was prepared before testing.

C. The pretest relative density (specific gravity) and temperate of the salt solution were checked to insure that it corresponded to the tolerance limits in of MIL-STD-810G.

D. A calibration run at 35°C (95°F) was performed on the test chamber to insure a fog collection of 0.5 to 3.0 milliliters per hour for each 80 square centimeters of horizontal collection area.

E. Any surface scratches or nicks on the EUT were noted.

F. After the calibration was verified, the EUT was placed in the salt fog test chamber.

G. The EUT was allowed to soak at 35°C (95°F) for 2 hours.

H. The salt solution was started and continuously atomized for 24 hours.

I. At the conclusion of the 2 hour exposure the EUT was removed from the salt fog chamber and allowed to dry for 2 hours.

J. Steps H-I were repeated for a total of two cycles

K. The EUT was then visually inspected for signs of corrosion or degradation and tested for functionality.

Test Results: The EUT was **compliant** with Salt Fog. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 8-12, 2018

Method 510.5 Sand and Dust

A. Sand and Dust, Procedure I, Blowing Dust (MIL-STD-810G, Method 510.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G, Method 510.5, Procedure I.

Test Procedure:

A. With the EUT in the chamber, the temperature was adjusted to standard ambient conditions and the air velocity to 8.9 ± 1.3 m/s. The test section relative humidity was set to less than 30% and was maintained throughout the test.

B. The dust feed control was adjusted to a dust concentration of 10 ± 7 g/m3.

C. These conditions were maintained for 6 hours. The EUT was rotated at 1 hour intervals to allow exposure to all surfaces.

D. The dust feed was stopped. The air velocity was reduced to approximately 1.5 m/s and the temperature was adjusted to 43 °C.

E. These conditions were maintained for 1 hour following test temperature stabilization.

F. The air velocity was adjusted to that used in Step A. The dust feed was restarted to maintain the dust concentration as in Step B.

G. The exposure was continued for at least 6 hours. The EUT was rotated at 1 hour intervals to allow exposure to all surfaces.

H. The EUT was allowed to return to standard ambient conditions, and the dust was allowed to settle.

I. Accumulated dust was removed from the EUT by brushing, wiping or shaking.

J. An operational check was performed to the EUT.

K. The EUT was inspected for dust penetration, giving special attention to bearings, grease seals, lubricants, filters, ventilation points, etc.

Test Results: The EUT was **compliant** with Sand and Dust, Procedure I. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 8 – October 10, 2018

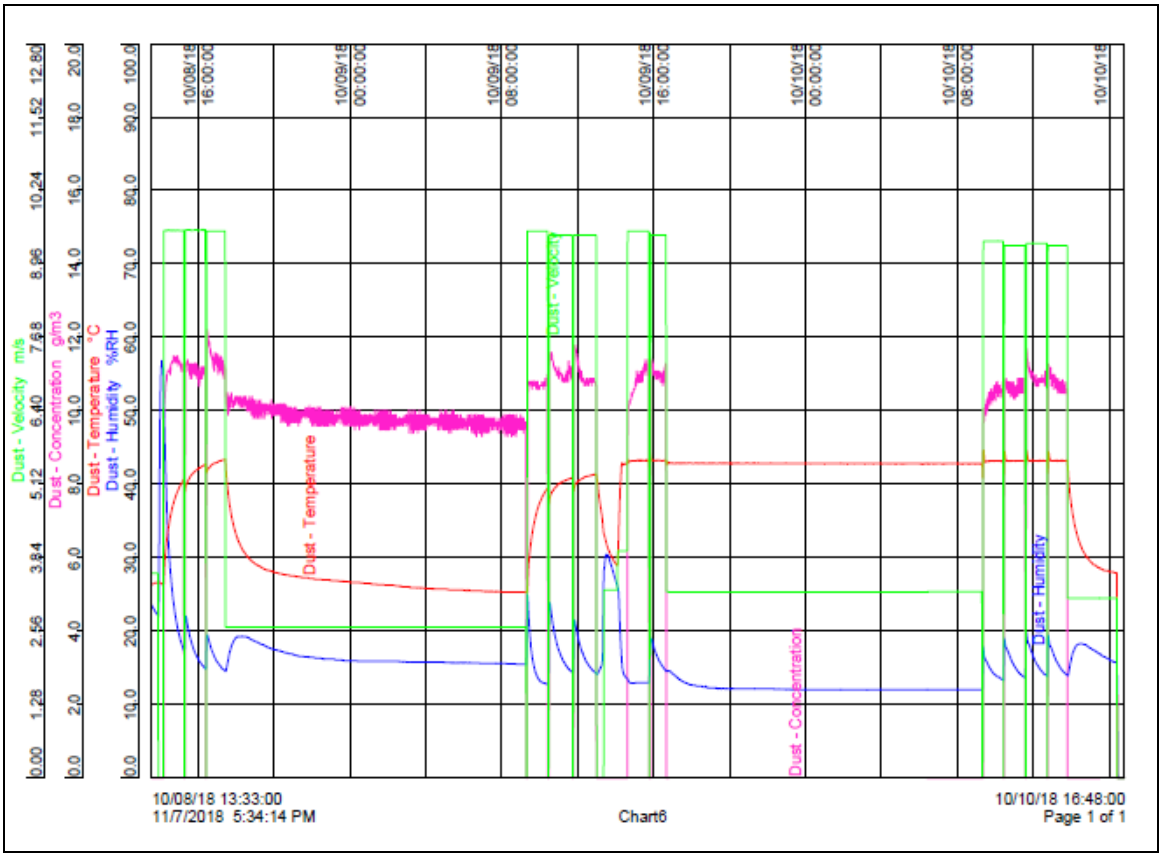
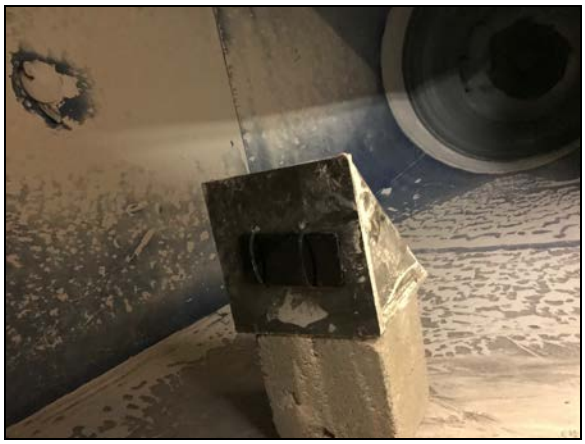


Chart 5. Sand and Dust, Procedure I, Blowing Dust, Test Results



Photograph 9. Sand and Dust, Procedure I, Blowing Dust, Test Setup 1

Photograph 10. Sand and Dust, Procedure I, Blowing Dust, Test Setup 2

Photograph 11. Sand and Dust, Procedure I, Blowing Dust, Test Setup 3

Photograph 12. Sand and Dust, Procedure I, Blowing Dust, Test Setup 4

Photograph 13. Sand and Dust, Procedure I, Blowing Dust, Test Setup 5

Photograph 14. Sand and Dust, Procedure I, Blowing Dust, Test Setup 6

Method 512.5 Immersion

A. Immersion, Procedure I, Immersion (MIL-STD-810G, Method 512.5)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G, Method 512.5, Procedure I.

Test Procedure:

A. Three times immediately before the test, all doors and covers were opened and closed.

B. The immersion water temperature was measured and recorded.

C. The EUT was conditioned and the conditioning temperature and duration was recorded.

D. All sealed areas and valves were closed. The EUT was assembled in its test configuration. As quickly as possible, the EUT was immersed in water so that the uppermost point of the EUT was 1 ±0.1m below the surface of the water. The orientation of the EUT represented that of its most severe expected in-service orientation.

E. Following a 30-minute immersion period, the EUT was removed from the water. The exterior surfaces were wiped dry.

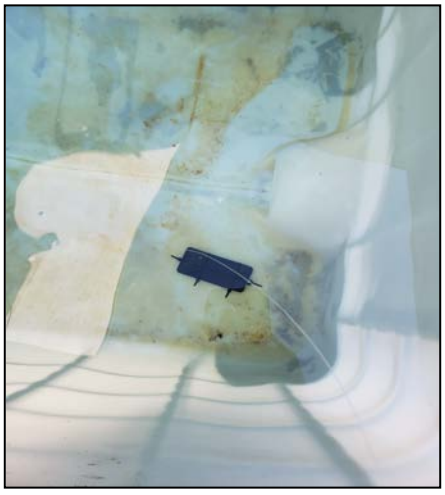
F. The EUT was opened and the interior was examined for evidence of and quantity of any leakage, and for probable areas of entry, if leakage occurred.

G. The EUT was functionally verified.

Test Results: The EUT was **compliant** with Immersion, Procedure I. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 18, 2018



Photograph 15. Immersion, Test Setup

Method 514.6 Vibration Contents

A. Procedure I - General Vibration (MIL-STD-810G, Method 514.6)

Category 4, Restrained Cargo

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G Method 514.6.

Test Procedure:

A. The EUT was installed on the vibration test fixture in the vertical axis. See Figure 2 for test set-up.

B. An input (control) accelerometer was mounted to the base of the test fixture as near as possible to the attachment point of the EUT.

C. A monitor accelerometer was mounted to each box.

D. The EUT was subjected to a random vibration, in the vertical axis. See Figure 514.6C-3 below for profile details.

E. The performance of the EUT was evaluated before, and after all axes of vibration were completed.

F. Steps A through D were repeated for the longitudinal and transverse axes. See Figure 3 for test set-up.

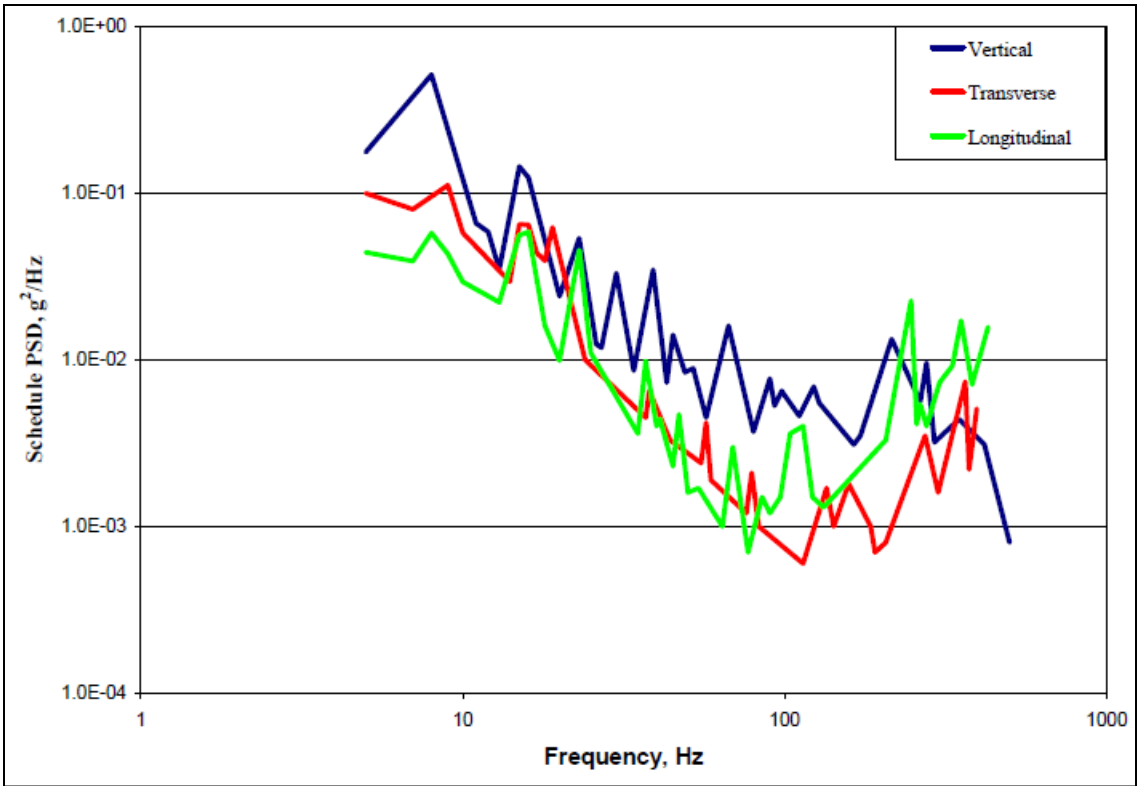


Figure 514.6C-3 – Category 4 - Composite wheeled vehicle vibration exposure.

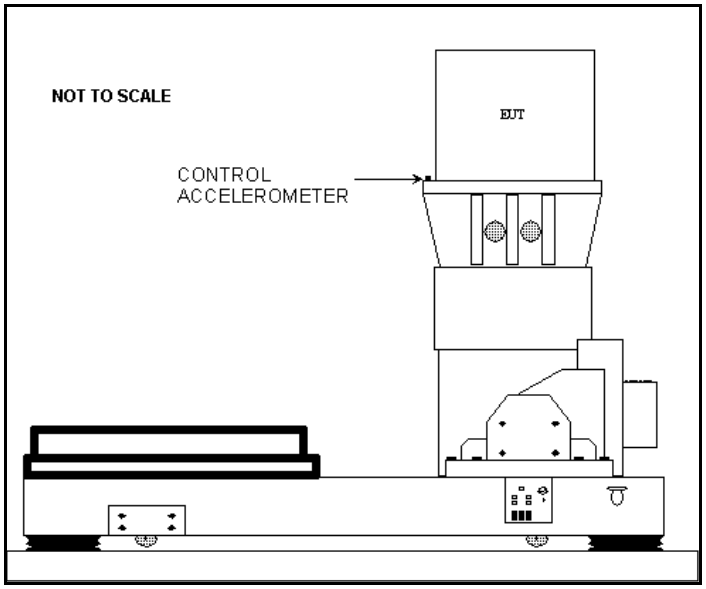


Figure 2. Vibration Test Set-up (Vertical Axis)

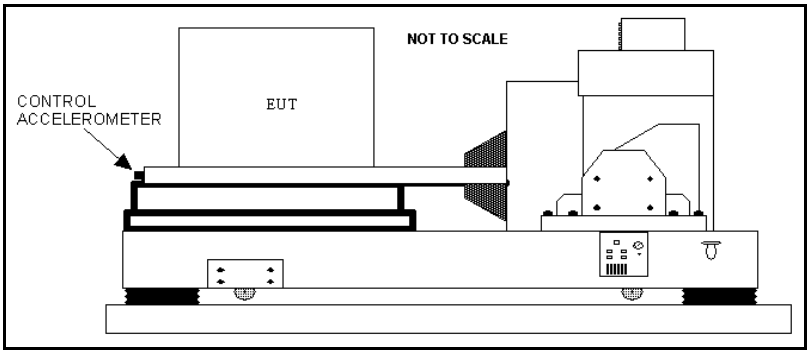


Figure 3. Vibration Test Set-up (Transverse and Longitudinal Axis)

Test Results: The EUT was **compliant** with Vibration, Category 4, Restrained Cargo. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 12 2018

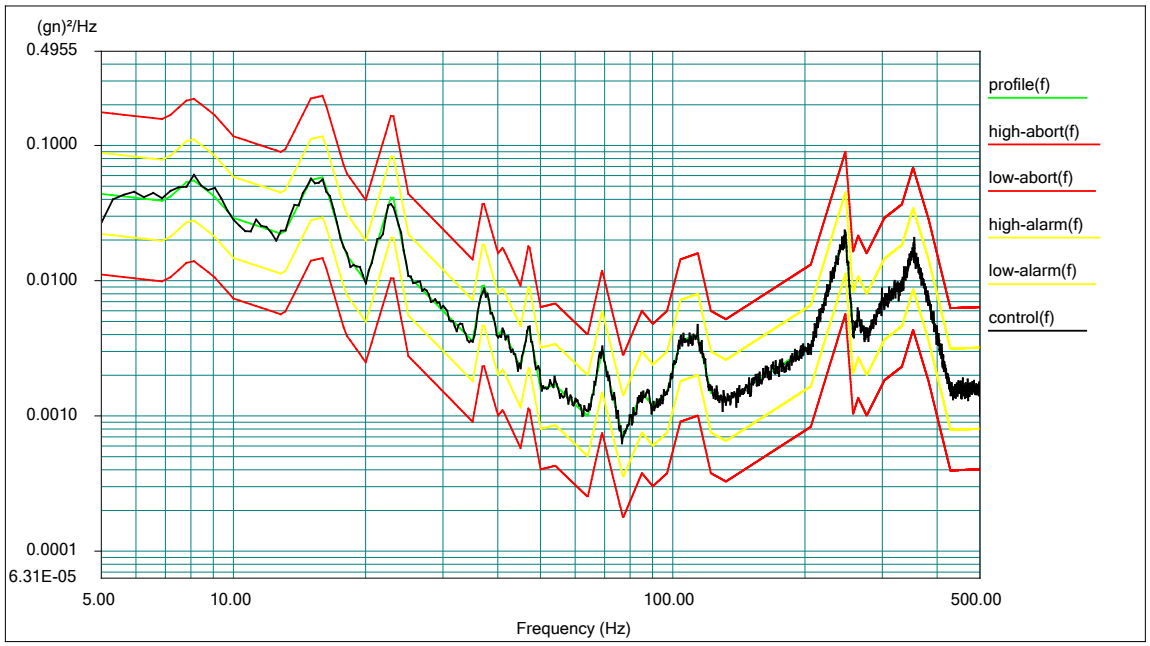


Chart 6. Vibration, Restrained Cargo, Longitudinal Axis, Control

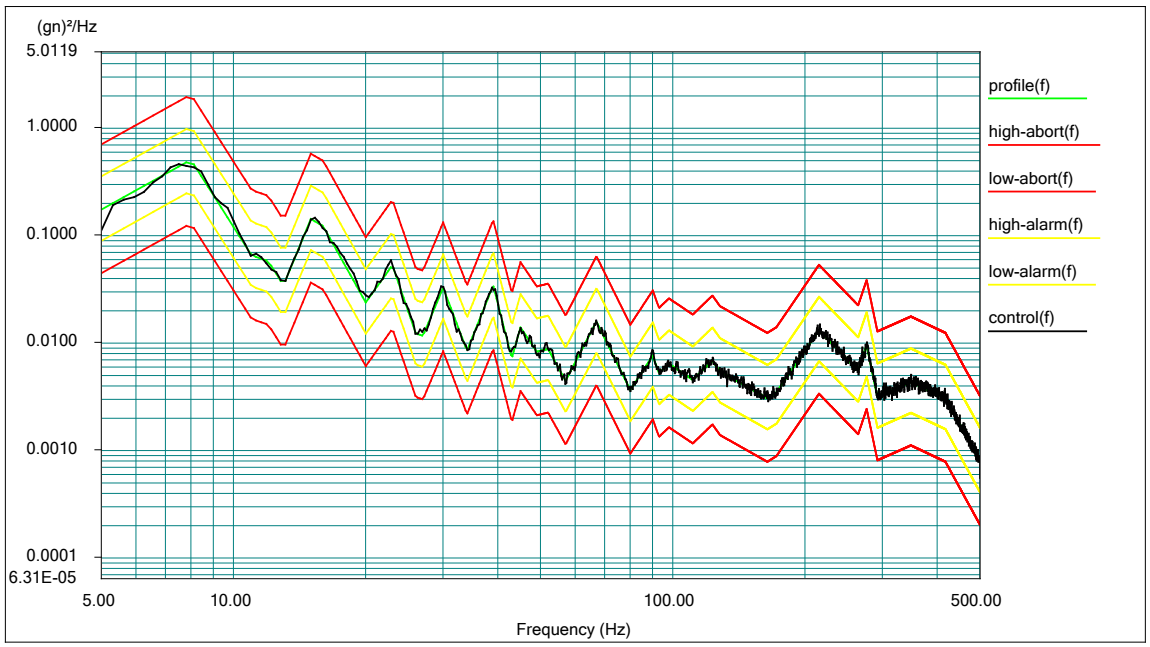
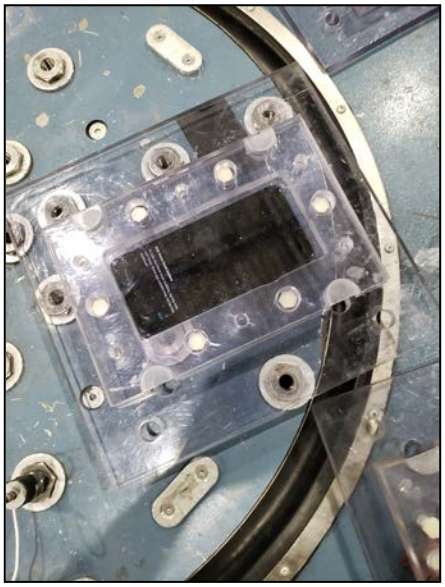
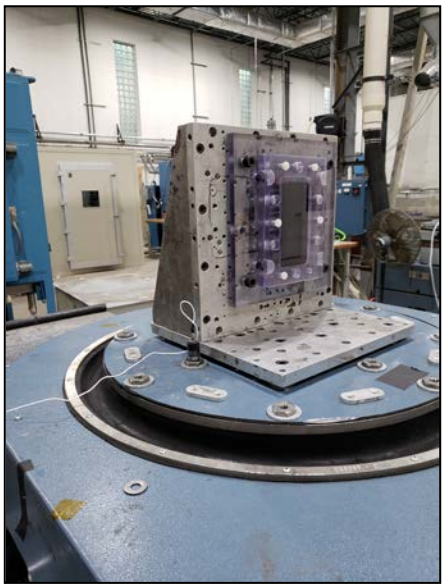


Chart 7. Vibration, Restrained Cargo, Transverse Axis, Control



Photograph 16. Vibration, Restrained Cargo, Test Setup 1



Photograph 17. Vibration, Restrained Cargo, Test Setup 2

Method 516.6 Shock

A. Shock, Procedure IV – Transit Drop (MIL-STD-810G, Method 516.6)

Test Requirement(s): The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G Method 516.6, Procedure IV.

Test Procedure:

A. The test was performed on an unpackaged EUT. The EUT was subjected to drops as per **Table 516.6-VI** (shown below)

Table 516.6-VI. Transit drop test.

Weight of Test Item & Case kg (lbs)	Largest Dimension, cm (in)	Notes	Height of Drop, h cm (in)	Number of Drops
Under 45.4 (100) Manpacked or man-portable	Under 91 (36)	A/	122 (48)	Drop on each face, edge and corner; total of 26 drops D/
	91 & over	A/	76 (30)	
45.4 - 90.8 (100 – 200) inclusive	Under 91	A/	76 (30)	Drop on each corner; total of eight drops
	91 & over	A/	61 (24)	
90.8-454 (200 – 1000) inclusive	Under 91	A/	61 (24)	
	91 – 152 (36 – 60)	B/	61 (24)	
	Over 152	B/	61 (24)	
Over 454	No limit	C/	46 (18)	Drop on each bottom edge. Drop on bottom face or skids; total of five drops

B. The test was performed on a 2-inch wood floor.

C. The EUT was dropped from a quick release and hand held method.

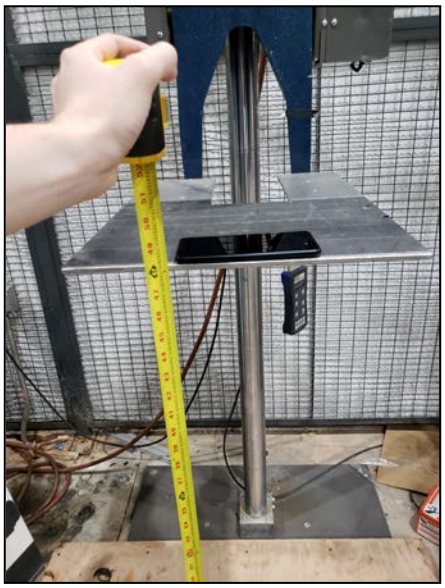
D. The drops were divided between 5 units.

Test Results The EUT was compliant with the requirements of MIL-STD-810G, Method 516.6, Procedure IV – Transit Drop. No anomalies were observed.

Test Engineer: John Peters

Test Date: October 17, 2018

Photograph 18. Shock, Procedure IV – Transit Drop, Test Setup 1



Photograph 19. Shock, Procedure IV – Transit Drop, Test Setup 2

Test Equipment

Test Name: Method 500.5, Low Pressure (Altitude)			Test Date: September 17, 2018		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T8243	PRESSURE VESSEL/ OVER PRESSURE CONTROLLER	MET/WATLOW	F4	17-JUL-18	17-JUL-19
Test Name: Method 501.5, High Temperature			**Test Date: August 20 – 23, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T5566	TEMP/RH CHAMBER (H3)	THERMOTRON	SM-32C	11-JUN-18	11-JUN-19
Test Name: Method 502.5, Low Temperature			**Test Date: August 21 – 25, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T5566	TEMP/RH CHAMBER (H3)	THERMOTRON	SM-32C	11-JUN-18	11-JUN-19
Test Name: Method 503.5, Temperature Shock			**Test Date: August 27 and 28, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T5654	3-ZONE TEMP. SHOCK CHAMBER (T6)	THERMOTRON	ATS 1040-DD30-25LNZ	31-OCT-17	31-OCT-18
Test Name: Method 505.5, Solar Radiation (Sunshine)			**Test Date: September 12 – 14, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T9595	WATLOW CONTROLLER	WATLOW	F4	SEE NOTE	
Test Name: Method 506.5, Rain			**Test Date: August 31, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T8205	ANEMOMETER	EXTECH INSTRUMENTS	407113	29-MAR-18	29-MAR-19
Test Name: Method 507.5, Humidity			**Test Date: August 22 – September 5, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T 1079	CHAMBER	THERMOTRON/ THERMOTRON/ VAISALA	SM-8/ 2800/ HMM30C	07-JUN-18	07-JUN-19
Test Name: Method 509.5, Salt Fog			**Test Date: September 20 – 31, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T5925	CORROSION TEST CHAMBER	SINGLETON CORPORATION	SCCH23	08-FEB-18	08-FEB-19
Test Name: Method 510.5, Sand and Dust			**Test Date: September 12 and 13, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T8055	BLOWING DUST CHAMBER	ED&D PRODUCT SAFETY SOLUTIONS	DTC-MIL-09	15-FEB-17	15-FEB-19
Test Name: Method 512.5, Immersion			**Test Date: August 31, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T5047	3-CHANNEL ALARM TIMER	FISCHER BRAND	06-662-5, 11725863	12-JUL-18	12-JUL-20
Test Name: Method 514.6, Vibration Contents			**Test Date: August 31, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T5663	UD SHAKER SYSTEM	UNHOLTZ DICKIE	R24C	SEE NOTE	
2T5871	SHAKER CONTROL SYSTEM	LDS DACTRON	LASER USB	21-MAY-18	21-MAY-19
Test Name: Method 516.6, Shock			**Test Date: August 31, 2018**		
MET #	**Equipment**	**Manufacturer**	**Model #**	**Last Cal**	**Cal Due**
2T8179	PDT DROP TEST SYSTEM	LANSMONT CORPORATION	PDT-56ED	SEE NOTE	

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.