



**Keystone Compliance, LLC
131 Columbus Inner Belt
New Castle, PA 16101**

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Will-Burt Company

1608-019NB-3



ENVIRONMENTAL TEST REPORT 1608-019NB-3 REV. A

TEST STANDARDS: MIL-STD-810G

For

WILL-BURT COMPANY

169 SOUTH MAIN ST
ORRVILLE, OH 44667


On

PNEUMATIC MAST WITH REMOTE LOCKING SYSTEM


MODEL NUMBER: N/A ; PART NUMBER: N/A ; SERIAL NUMBER: N/A

PERFORMED BY: KEYSTONE COMPLIANCE, LLC.
131 COLUMBUS INNER BELT
NEW CASTLE, PA 16101

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Approved By:  Date: 9/27/2018
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Testing Services

www.keystonecompliance.com

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

DOCUMENT HISTORY				
Revision	Issue Date	Description Of Modifications	Revised By	Approved By
N/C	9/20/2018	Initial release	N/A	R.T.
A	9/27/2018	Update Product Description	CP	RT

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

CLIENT INFORMATION	
Purchase Order	MDWX001047
Quote Number	1608-019NB-3
EUT Arrival Date	3/19/2018 -- Received in good condition
Company Name	Will-Burt Company
Address	169 South Main St
City, State Zip	Orrville, OH 44667
Contact Name	Andrew Wasson
Phone	330-684-4031
Email	awasson@willburt.com

TEST FACILITY INFORMATION	
Test Laboratory	Keystone Compliance, LLC.
Address	131 Columbus Inner Belt
City, State, Zip Code	New Castle, PA 16101
Phone	(724) 657-9940
Fax	(724) 657-9920
Web Site	www.keystonecompliance.com
Contact Name	Robert Turner
Title	Environmental Lab Manager
E-Mail Address	Bob@keystonecompliance.com

TEST PROGRAM INFORMATION	
Test Personnel	Tim Swartz -- Sr Test Technician
Test Title & Test Dates	High Temperature – June 21, 2018 to June 29, 2018 Low Temperature – March 28, 2018 to March 30, 2018 Thermal Shock – August 13, 2018 to August 18, 2018 Solar Radiation – July 10, 2018 to July 13, 2018 Rain – July 17, 2018 Humidity – June 29, 2018 to July 9, 2018 Salt Fog – August 18, 2018 to September 4, 2018 Icing/Freezing Rain – April 2, 2018 to April 3, 2018



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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

INTRODUCTION

This report documents the results of the Environmental tests performed on the UHD Pneumatic Mast, Model Number: N/A ; Part Number: N/A; Serial Number: N/A, submitted by Will-Burt Company

The Environmental test programs described herein were performed in accordance with the applicable requirements of MIL-STD-810G.

All test data is included in Section 3 of this document.

All tests performed at Keystone Compliance New Castle, PA Environmental test facility. All tests were performed using the test set-ups of the relevant standard for tests performed in laboratory conditions.

ACRONYMS AND ABBREVIATIONS

°C – Degrees Celsius
cm – Centimeter
m – Meters
N/A – Not Applicable
M/N – Model Number
P/N – Part Number
S/N – Serial Number
UUT – Unit Under Testing

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

EQUIPMENT UNDER TEST(S)

EUT		
Description		Manufacturer
UHD Pneumatic Mast		Will-Burt Company
Model Number	Part Number	Serial Number
N/A	N/A	N/A



ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

SUMMARY OF TESTS PERFORMED & RESULTS
TABLE 1 TESTS PERFORMED & RESULTS

Report Paragraph	Test Description	Results
3.3	High Temperature	No obvious signs of damage to UHD Pneumatic Mast, due to High Temperature testing conditions. UHD Pneumatic Mast met the criteria of the specification.
3.4	Low Temperature	No obvious signs of damage to UHD Pneumatic Mast, due to Low Temperature testing conditions. UHD Pneumatic Mast met the criteria of the specification.
0	Thermal Shock	No obvious signs of damage to UHD Pneumatic Mast, due to Thermal Shock testing conditions. UHD Pneumatic Mast met the criteria of the specification.
0	Solar Radiation	No obvious signs of damage to UHD Pneumatic Mast, due to Solar Radiation testing conditions. UHD Pneumatic Mast met the criteria of the specification.
3.7	Rain	No obvious signs of damage to UHD Pneumatic Mast, due to Rain testing conditions. UHD Pneumatic Mast met the criteria of the specification.
0	HUMIDITY	No obvious signs of damage to UHD Pneumatic Mast, due to HUMIDITY testing conditions. UHD Pneumatic Mast met the criteria of the specification.
3.9	Salt Fog	No obvious signs of damage to UHD Pneumatic Mast, due to Salt Fog testing conditions. UHD Pneumatic Mast met the criteria of the specification.
3.10	Icing/Freezing Rain	No obvious signs of damage to UHD Pneumatic Mast, due to Icing/Freezing Rain testing conditions. UHD Pneumatic Mast met the criteria of the specification.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

SECTION 1 – TEST CONDITIONS AND EQUIPMENT

1.1 AMBIENT ENVIRONMENTAL CONDITIONS

Unless otherwise specified herein, all tests were performed at an atmospheric pressure of 28 ± 2.5 inches of mercury absolute, a temperature of $75 \pm 15^\circ\text{F}$, and a relative humidity of $50 \pm 30\%$.

1.2 INSTRUMENTATION AND EQUIPMENT

Measuring and test equipment, utilized in the performance of these tests, was calibrated in accordance with ANSI/NCSL Z540-3-2006, by Keystone Compliance, LLC.. or a commercial facility, utilizing reference standards (or interim standards) whose calibrations have been certified as being traceable to the National Institute of Standards & Technology (NIST). All reference standards utilized in the above calibration system are supported by certificates, reports, or data sheets attesting to the date, accuracy, and conditions under which the results furnished were obtained. All subordinate standards, measuring and test equipment are supported by like data, when such information is essential to achieve the accuracy control required by the procedure.

Keystone Compliance, LLC.. attests that the commercial sources providing calibration services on the above referenced equipment, other than the NIST Standards are in fact capable of performing the required services to the satisfaction of Keystone Compliance, LLC.. Quality Assurance. Certifications of all calibrations performed are retained on file in the Keystone Compliance, LLC.. Quality Assurance Department, and are available for inspection upon request by customer representatives.

The test equipment utilized during this test program is listed on individual Test Equipment Sheets located in Section 3 of this document.

1.3 TOLERANCES

All test conditions were maintained within all applicable specified tolerances.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

SECTION 2 – REFERENCES

2.1 APPLICABLE SPECIFICATIONS

Reference Specification Title	MIL-STD-810G Environmental Engineering Considerations and Laboratory Tests
Calibration Information	ANSI/NCSL Z540-3-2006 Calibration Laboratories and Measuring Test Equipment - General Requirements



ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

SECTION 3 – TEST LOGS, TEST EQUIPMENT, TEST DATA, & TEST PHOTOGRAPHS

3.1 TEST LOG

Test Log			
EUT:	UHD Pneumatic Mast	Job Number:	1608-019NB-3
Customer:	Will-Burt Company	Model Number:	N/A
Date:	3/28/18 – 9/4/18	Part Number:	N/A
Test Engineer:	T. Swartz	Serial Number:	N/A
Test:	All Tests		
Test Specifications			
Test Spec:	MIL-STD-810G	Para./Sec.:	See Data

Test Log			
Date	Time	Units Tested	Description
03/19/18			Received Units Under Testing, and preformed preliminary functional evaluation on all units.
03/23/18			EMC Testing was completed on all Units Under Testing, and the units were brought back to the Environmental side. I again performed a pre-testing functional verification.
Low Temperature Testing (MIL-STD-810G, Method 502.5)			
03/28/18	11:25	3	Started logging thermal conditions of the testing chamber, and UUT.
	12:05	3	Ramped Chamber to -51°C
	12:50	3	Chamber Stabilized at -51°C
03/29/18	09:20	3	Removed Units from Chamber and preformed a functional test while at Low Temperatures.
	09:51	3	Placed Units back into thermal chamber
	10:25	3	Ramped Chamber back to ambient conditions.
03/30/18	08:47	3	Chamber, and UUT's stabilized at ambient conditions.
			Test Complete. A post-test functional test was preformed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the preformed testing.
Icing / Freezing Rain Testing (MIL-STD-810G, Method 521.3) Mast Out			
04/02/18	08:00	3	Put UUT's in testing chamber and preformed a functional checkout
	08:22	3	Started Logging thermal conditions
	08:24	3	Ramped Chamber to 0°C
	09:05	3	Stabilized at 0°C
	09:15	3	Turned on pre-cooled water spray

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Test Log			
Date	Time	Units Tested	Description
Icing / Freezing Rain Testing (MIL-STD-810G, Method 521.3) Mast Out			
04/02/18	10:20	3	Ramped chamber to -10°C
	11:25	3	1/4" of ice was produced
	15:25	3	Operated the UUT's
	15:55	3	Ramped back to ambient (23°C)
	16:00	3	Stabilized at ambient
			Test Complete. A post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.
Icing / Freezing Rain Testing (MIL-STD-810G, Method 521.3) Mast In			
	16:35	3	Started Logging thermal conditions
	16:44	3	Ramped Chamber to 0°C
	17:35	3	Stabilized at 0°C
	17:40	3	Turned on pre-cooled water spray
	18:51	3	Ramped chamber to -10°C
	19:20	3	1/4" of ice was produced
	23:15	3	Operated the UUT's
04/02/18	23:53	3	Ramped back to ambient (23°C)
04/03/18	00:30	3	Stabilized at ambient
			Test Complete. A post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.
High Temperature Storage Testing (Method 501.5)			
06/21/18	09:43	3	Start High Temperature Storage Testing
06/29/18	15:46	3	Seven (7) cycles per Table 501.5-III completed.
			Testing Complete. A post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Test Log			
Date	Time	Units Tested	Description
Humidity Testing (Method 507.5)			
06/29/18	16:40	3	Start Category B1 Humidity Testing
07/08/18	22:16	3	Humidity Testing complete. Three Induced Cycles, and Three Natural Cycles were performed per customer.
			Testing Complete. A post-test functional test was preformed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the preformed testing.
High Temperature Operational (Method 502.5)			
07/09/18	07:49	3	Start High Temperature (Operational) Testing
	16:44	3	High Temperature Testing complete.
			Testing Complete. A post-test functional test was preformed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the preformed testing.
Solar Radiation Testing (Method 505.5)			
07/10/18	07:49	3	Start Solar Radiation Testing. (Three 24-hour cycles)
07/13/18	16:44	3	Solar Radiation Testing complete.
			Testing Complete. A post-test functional test was preformed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the preformed testing.
Blowing Rain Testing (Method 506.5)			
07/17/18	11:35	1	Start Blowing Rain Testing (Pneumatic Mast w Auto-Locks)
	13:50	1	Testing Complete
			Testing Complete. A post-test functional test was preformed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the preformed testing.

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Test Log			
Date	Time	Units Tested	Description
Rain Testing (Method 506.5)			
07/17/18	16:10	1	Start Rain Testing (Pneumatic Mast w Auto-Locks)
	16:18	1	Testing Complete
			<i>Testing Complete. A post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.</i>
Thermal Shock Testing (Method 503.5)			
08/13/18	09:12	3	Start Category I-B Thermal Shock Testing (High Temperature)
08/15/18	13:30	3	Thermal Shock Testing complete. Two Cycles (from High to Low) were performed on all three units.
			<i>Testing Complete. A post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.</i>
Thermal Shock Testing (Method 503.5)			
08/15/18	15:02	3	Start Category I-B Thermal Shock Testing (Low Temperature)
08/18/18	06:26	3	Thermal Shock Testing complete. Two Cycles from (Low to High) were performed on all three units.
			<i>Testing Complete. A post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.</i>
Salt Fog Testing (Method 509.5)			
08/31/18	16:49	1	Start Salt Fog Testing (Pneumatic Mast with Auto Locks)
09/02/18	17:20	1	Salt Fog Testing complete.
09/04/18	17:30		<i>UUT was left to dry for 48 hours, and a post-test functional test was performed, and there were no anomalies noted. Upon inspection of the units there were no signs of damage, or deterioration resulting from the performed testing.</i>

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.2 EQUIPMENT LIST

Equipment Log			
EUT:	UHD Pneumatic Mast	Job Number:	1608-019NB-3
Customer:	Will-Burt Company	Model Number:	N/A
Date:	3/28/18 - 9/4/18	Part Number:	N/A
Test Engineer:	T. Swartz	Serial Number:	N/A
Test:	All Tests		
Test Specifications			
Test Spec:	MIL-STD-810G	Para./Sec.:	See Data

Test Equipment					
Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
EC043	Infrared Thermometer	Fluke	561	None	REF
NA002	Hydra Series 2	Fluke	2620A	6234500	6/21/2019
NA005	Hydra Series III	Fluke	2638A	33600003	2/5/2019
NA009	Hydra Series II	Fluke	2620A	9188006	5/31/2019
NC003	Chamber, Salt Fog	Singleton Corp.	24	24362	UWCE
NC004	Chamber	Espec	EWPT287-5JW	302510	1/30/2019
NC012	Chamber, Temperature & Humidity	Espec	EWPX1069-12CWL	3512362	1/30/2019
NC018	Immersion Tank	Keystone Compliance	None	None	UWCE
NC023	Temperature & Humidity Chamber	CSZ Manufacturing	WMTH-250-6-6-s/wc	00-wm13552	4/3/2019
NG002	Rain Gauge	Garden Treasures	0083230	None	IPU
NG003	Rain Gauge	Garden Treasures	0083230	None	IPU
NG011	Wind and Rain Generator	Buffalo Turbine	CKB4	19038	UWCE
NG015	Nozzle	Epiphany Labs	None	12.5	IPU
NG017	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU
NG018	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU
NG019	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU

UWCE: Used With Calibrated Equipment

REF: Reference Only

IPU: Inspect Prior to Use

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Test Equipment					
Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
NG021	Hydrometer	Fisher Scientific	11-542A	C78391	CBU
NG032	Valor 1000 Industrial Scale	Ohaus	V11P6	30922228	6/5/2019
NG039	Rain Gauge	Taylor	2700N	None	IPU
NG055	Protractor	Craftsman	39840	None	Reference Only
NG059	Temperature Chamber Extension	Keystone	None	None	UWCE
NG060	Solar Radiation Fixture	Keystone	None	None	UWCE
NG067	Pressure Gauge 0-3000	Ashcroft	25w1005ph 02l xc4	e300680	3/20/2019
NG088	Floor Scale and Display	DigiWeigh	DWP- 55007/IN202	007012	6/5/2019
NG091	Graduated Cylinder	Kimble	None	None	UWCE
NG101	Tape Measure	Starrett	TX1-26ME	17413606	11/27/2018
NG103	Stop Watch	Control Company	1051	170849524	12/5/2019
NG108	Thermometer	Control Company	4371	170772501	11/3/2019
NM001	Pyranometer	Kipp & Zonen	CMP 3	115883	5/29/2019
NM003	Flow Meter (3-30GPM)	Omega	FP2006-R	None	REF
NM005	Anemometer (Wind Gauge)	Nielson-Kellerman	Kestrel 4000	649683	6/13/2019
NM006	PH Meter	Omega	PHH222	57608	CBU
NM007	Buffer Solution Kit, PH Meter	Inorganic Ventures	Phblue- 10/Phred- 4/Phyellow-7	None	REF
NM021	Salinity/Conduction Meter	Hach	9532700	1404270010 10	CBU
NM034	Temperature / Humidity Meter	Control Company	4096	170594613	9/29/2018
NP016	Pressure Gauge	SSI Technologies	MG1-30-A- 9V-R	1410150228	6/14/2019
NS005	Hydra Logger Monitoring Software	Fluke	Version 3.0	None	UWCE
NS007	Espec Monitoring System	Espec	ERC-1005	v1.21	UWCE

UWCE: Used With Calibrated Equipment

REF: Reference Only

IPU: Inspect Prior to Use

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Test Equipment					
Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
NT005	Immersion Tank	Unknown	None	None	UWCE
NZ000	Salt	Morton	Batch# SS15286023	None	UWCE
NZ007	Conductivity Solution	Inorganic Ventures	(catalog:con14 13-25)	Lot m2- cond654974	9/18/2018
NZ008	NAOH (+)	Inorganic Ventures	0.1 M-NAOH	Lot m2- wcs661749	9/26/2021
NZ009	HCL (-)	Inorganic Ventures	1.0M-HCL	Lot k2- wcs03002	2/26/2020
OA011	Desktop Computer	Keystone	None	None	UWCE
OA013	Dell Latitude Laptop	Dell	D620	2496441301 3	UWCE
OA017	Dell Latitude Laptop	Dell	D620	34450866145	UWCE

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OF: 3	QUALITY REVIEWER: J. Sullivan

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3.3 HIGH TEMPERATURE TEST

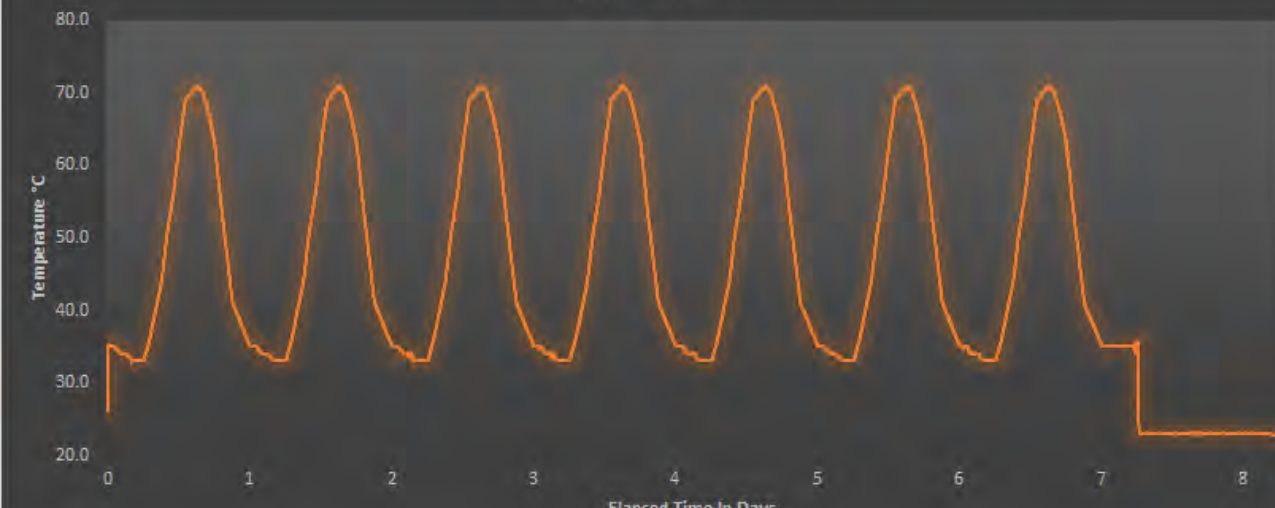
- a) The High Temperature test requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The High Temperature test log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The High Temperature test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the High Temperature test on the UHD Pneumatic Mast is located in Paragraph 3.3.1 of this document.
- e) The High Temperature test photographs for the UHD Pneumatic Mast are located in Paragraph 3.3.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.3.1 HIGH TEMPERATURE TEST DATA


High Temperature (Operating) Data Sheet						
EUT:	UHD Pneumatic Mast			Job Number:	1608-019NB-3	
M/N:	N/A	P/N:	N/A	S/N:	N/A	
Customer:	Will-Burt Company					
Date:	6/21/18 - 6/29/18			Test Engineer:	T. Swartz	
Test Specifications						
Test Spec.:	MIL-STD-810G			Para./Sec.:	502.5	
Test Profile						
 <p>#1608-019NB The Wil-Burt Company MIL-STD-810G, Method 502.5 High Temperature (Operational) Testing 07/09/2018</p> <p>— Chamber Air — Response I — Response II</p>						
Environmental Profile Information						
Test Cycle Begins At:	07:49 on 07/09/2018					
Test Cycle Ends At:	16:44 on 07/09/2018					
Total Number of Cycles:	1					
Cycle Duration:	2 hours after temperature stabilization is reached					
EUT Test Information	Y	N	N/A	Comments		
Operating During Test:		X		Operating Mode:	N/A	
Powered During Test:		X		V	N/A	A N/A AC/DC N/A
Physical Damage Noted:		X		Units were all tested (functionally), after soaking 2 hours at 60°C.		
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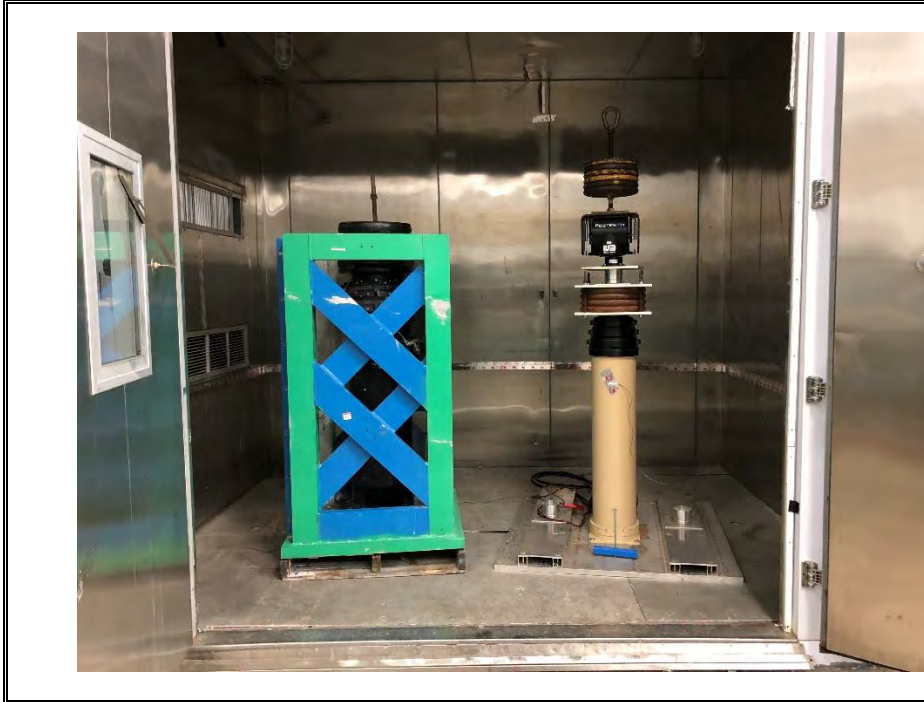
High Temperature (Storage) Data Sheet											
EUT:	UHD Pneumatic Mast				Job Number:	1608-019NB-3					
M/N:	N/A	P/N:	N/A		S/N:	N/A					
Customer:	Will-Burt Company										
Date:	6/21/18 - 6/29/18				Test Engineer:	T. Swartz					
Test Specifications											
Test Spec.:	MIL-STD-810G				Para./Sec.:	502.5					
Test Profile											
<p>#1608-019NB The Will-Burt Company MIL-STD-810G, Method 501.5 High Temperature (Storage) Testing "Chamber Air" 06/21/2018-06/29/2018</p> 											
Environmental Profile Information											
Test Cycle Begins At:	09:43 on 06/21/2018										
Test Cycle Ends At:	15:46 on 06/29/2018										
Total Number of Cycles:	7										
Cycle Duration:	24 Hours										
EUT Test Information			Y	N	N/A	Comments					
Operating During Test:				X		Operating Mode: N/A					
Powered During Test:				X		V	N/A	A	N/A	AC/DC	N/A
Physical Damage Noted:				X		Units were all tested (functionally) at the completion of the 7 th cycle (35°C), and again after testing was completed at ambient (23°).					
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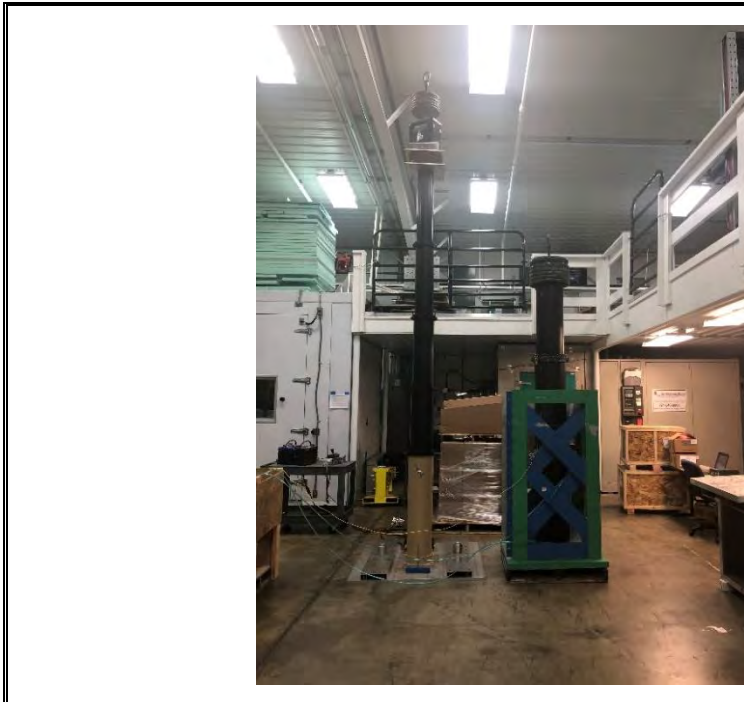
3.3.2 HIGH TEMPERATURE TEST PHOTOGRAPHS

	High Temperature	
	MIL-STD-810G	
	Operating Test Setup	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	6/21/18 - 6/29/18
	Job #:	1608-019NB-3

	High Temperature	
	MIL-STD-810G	
	Response Location	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	6/21/18 - 6/29/18
	Job #:	1608-019NB-3

REPORT NO.: 1608-019NB-3
REVISION: A
ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY


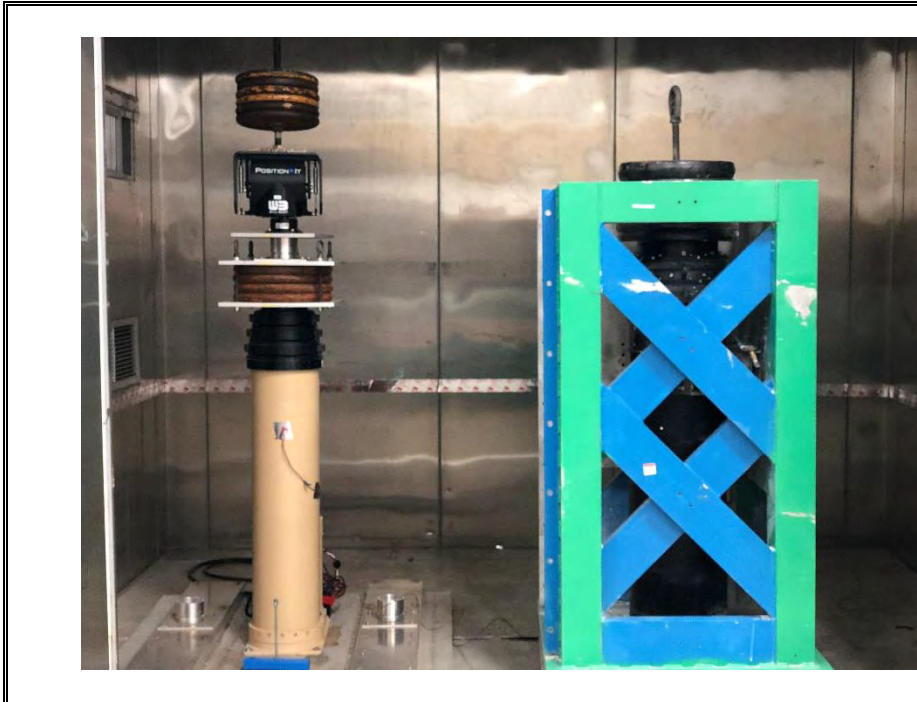
High Temperature	
MIL-STD-810G	
Post Test (Pre-Functional Check)	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/21/18 - 6/29/18
Job #:	1608-019NB-3



High Temperature	
MIL-STD-810G	
Post Operating Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/21/18 - 6/29/18
Job #:	1608-019NB-3

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REVISION: A

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High Temperature	
MIL-STD-810G	
Storage Test Setup	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/21/18 - 6/29/18
Job #:	1608-019NB-3



High Temperature	
MIL-STD-810G	
Response Location	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/21/18 - 6/29/18
Job #:	1608-019NB-3

REPORT NO.: 1608-019NB-3
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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY



High Temperature	
MIL-STD-810G	
Post Storage Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/21/18 - 6/29/18
Job #:	1608-019NB-3

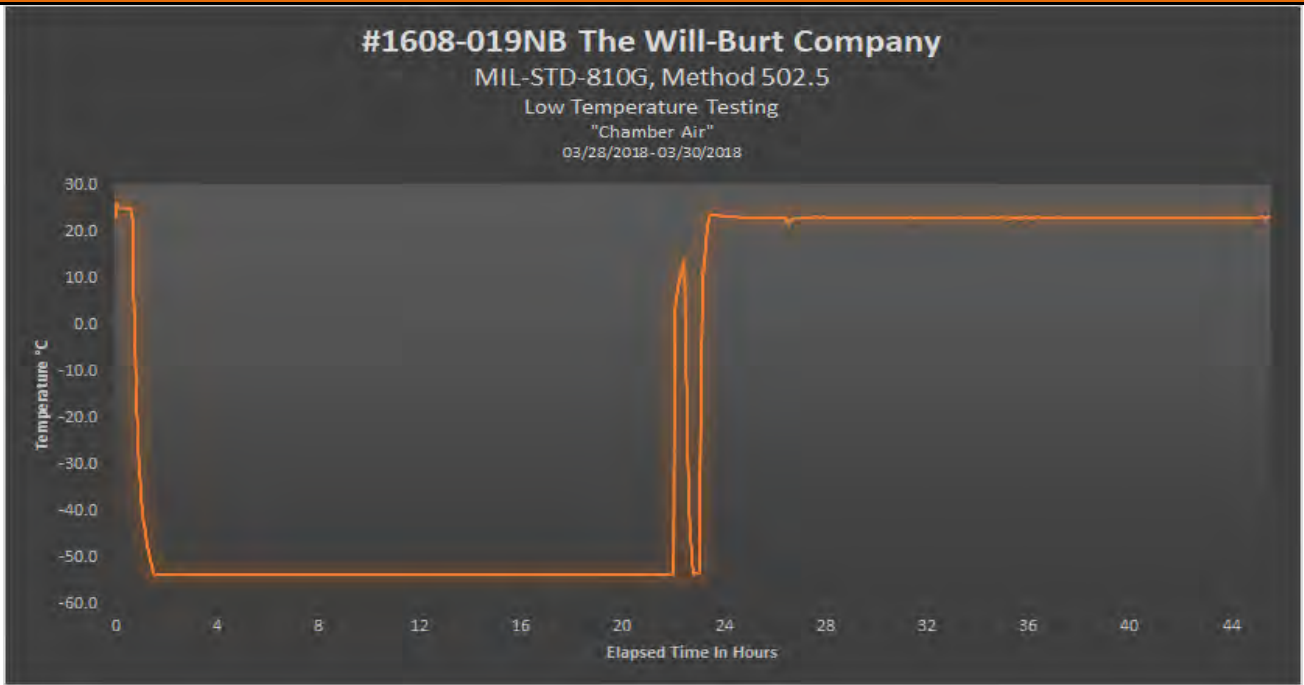
ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.4 LOW TEMPERATURE TEST

- a) The Low Temperature requirement for the UHD Pneumatic Mast is specified in MIL-STD-810G.
- b) The Low Temperature test log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The Low Temperature test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the Low Temperature test on the UHD Pneumatic Mast is located in Paragraph 3.4.1 of this document.
- e) The Low Temperature test photograph for the UHD Pneumatic Mast is located in Paragraph 3.4.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.4.1 LOW TEMPERATURE TEST DATA

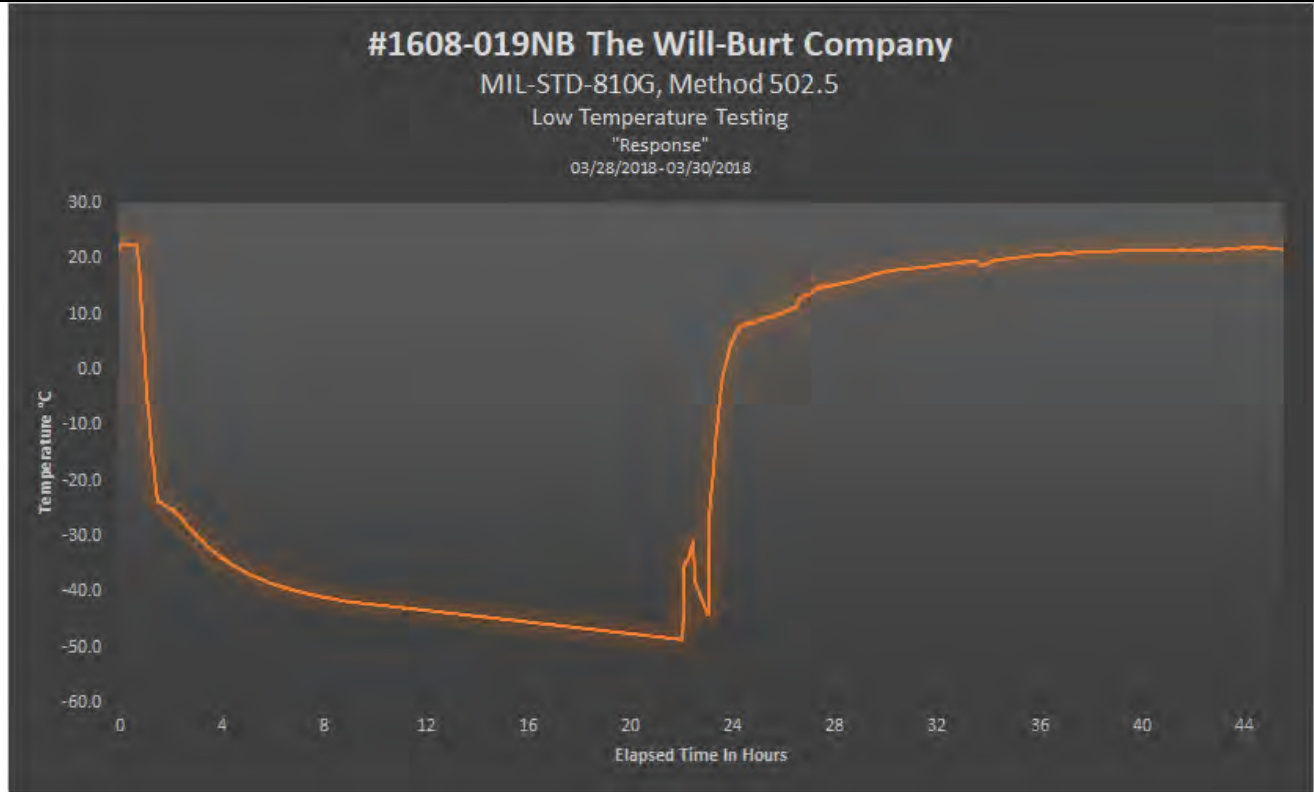
Low Temperature Data Sheet					
EUT:	UHD Pneumatic Mast			Job Number:	1608-019NB-3
M/N:	N/A	P/N:	N/A	S/N:	N/A
Customer:	Will-Burt Company				
Date:	3/28/18 - 3/30/18			Test Engineer:	T. Swartz
Test Specifications					
Test Spec.:	MIL-STD-810G			Para./Sec.:	502.5
Chamber Profile					
#1608-019NB The Will-Burt Company MIL-STD-810G, Method 502.5 Low Temperature Testing "Chamber Air" 03/28/2018 - 03/30/2018					
					
Environmental Profile Information					
Test Cycle Begins At:	11:25 on 03/28/2018				
Test Cycle Ends At:	08:47 on 03/30/2018				
Total Number of Cycles:	1				
Target Temperature:	-51°C				
Cycle Duration:	UUT's to be soaked a minimum of two hours once the testing chamber stabilizes at target.				
EUT Test Information	Y	N	N/A	Comments	
Operating During Test:	X			Operating Mode:	Powered On for functional evaluation.
Powered During Test:	X			V	12.6 A AC/DC DC
Physical Damage Noted:		X		One unit is pneumatic powered, and the other units are DC powered.	
PAGE: 1	ENGINEER/TECHNICIAN(s): T. Swartz				
OF: 2	TECHNICAL REVIEWER: R. Turner				

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Low Temperature Data Sheet

EUT:	UHD Pneumatic Mast		Job Number:	1608-019NB-3	
M/N:	N/A	P/N:	N/A	S/N:	N/A
Customer:	Will-Burt Company				
Date:	3/28/18 - 3/30/18		Test Engineer:	T. Swartz	
Test Specifications					
Test Spec.:	MIL-STD-810G		Para./Sec.:	502.5	

Response Profile




Environmental Profile Information


Test Cycle Begins At:	11:25 on 03/28/2018
Test Cycle Ends At:	08:47 on 03/30/2018
Total Number of Cycles:	1
Target Temperature:	-51°C
Cycle Duration:	UUT's to be soaked a minimum of two hours once the testing chamber stabilizes at target.

PAGE: 2	ENGINEER/TECHNICIAN(S): T. Swartz
OF: 2	TECHNICAL REVIEWER: R. Turner

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.4.2 LOW TEMPERATURE TEST PHOTOGRAPHS

	Low Temperature	
	MIL-STD-810G	
	Test Setup	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	3/28/18 - 3/30/18
Job #:	1608-019NB-3	

	Low Temperature	
	MIL-STD-810G	
	Response Location	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	3/28/18 - 3/30/18
Job #:	1608-019NB-3	

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY



Low Temperature	
MIL-STD-810G	
Post Test Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	3/28/18 - 3/30/18
Job #:	1608-019NB-3

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.5 THERMAL SHOCK TEST

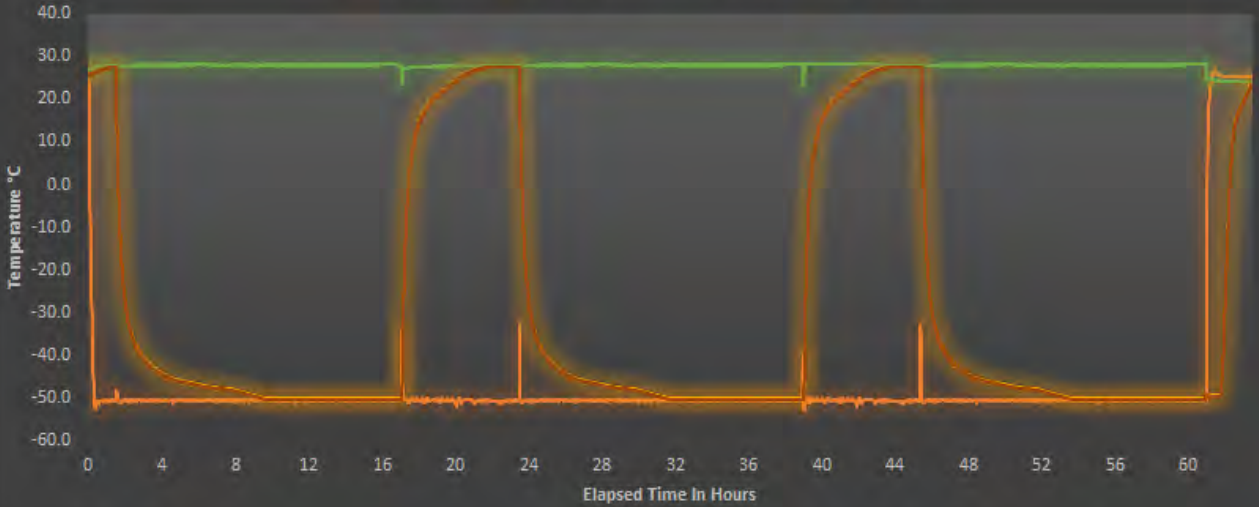
- a) The Thermal Shock requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The Thermal Shock Test Log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The Thermal Shock test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the Thermal Shock test on the UHD Pneumatic Mast is located in Paragraph 3.5.1 of this document.
- e) The Thermal Shock test photographs for the UHD Pneumatic Mast are located in Paragraph 3.5.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.5.1 THERMAL SHOCK TEST DATA


Thermal Shock (High Temperature) Data Sheet									
EUT:	UHD Pneumatic Mast				Job Number:	1608-019NB-3			
M/N:	N/A		P/N:	N/A		S/N:	N/A		
Customer:	Will-Burt Company								
Date:	8/13/18 - 8/18/18				Test Engineer:	T. Swartz			
Test Specifications									
Test Spec:	MIL-STD-810G				Para./Sec.:	503.5			
Test Profile									
<p>#1608-019NB The Wil-Burt Company MIL-STD-810G, Method 503.5 (Procedure I-B) Thermal Shock Testing 08/13/2018 - 08/15/2018</p> 									
Environmental Profile Information									
Test Cycle Begins At:	09:12 on 08/13/2018								
Test Cycle Ends At:	13:30 on 08/15/2018								
Target Setpoints:	+18°C to +49°C								
Total Number of Cycles:	2								
Cycle Duration:	TBD								
EUT Test Information			Y	N	N/A	Comments			
Operating During Test:				X		Operating Mode:		N/A	
Powered During Test:				X		V	N/A	A	N/A
Physical Damage Noted:				X					
PAGE:	1	ENGINEER/TECHNICIAN(S):		T. Swartz					
OF:	1	TECHNICAL REVIEWER:		R. Turner					


ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Thermal Shock (Low Temperature) Data Sheet											
EUT:	UHD Pneumatic Mast				Job Number:	1608-019NB-3					
M/N:	N/A	P/N:	N/A		S/N:	N/A					
Customer:	Will-Burt Company										
Date:	8/13/18 - 8/18/18				Test Engineer:	T. Swartz					
Test Specifications											
Test Spec:	MIL-STD-810G				Para./Sec.:	503.5					
Test Profile											
<p>#1608-019NB The Wil-Burt Company MIL-STD-810G, Method 503.5 (Procedure I-B) Thermal Shock Testing 08/15/2018 - 08/18/2018</p> <p>— Chamber 1 — Response 1 — Chamber 2 — Response 2</p>  <p>Temperature °C</p> <p>Elapsed Time In Hours</p>											
Environmental Profile Information											
Test Cycle Begins At:	15:02 on 08/15/2018										
Test Cycle Ends At:	06:26 on 08/18/2018										
Target Setpoints:	+27°C to -51°C										
Total Number of Cycles:	2										
Cycle Duration:	TBD										
EUT Test Information			Y	N	N/A	Comments					
Operating During Test:				X		Operating Mode:		N/A			
Powered During Test:				X		V	N/A	A	N/A	AC/DC	N/A
Physical Damage Noted:				X							
PAGE:	1	ENGINEER/TECHNICIAN(s):		T. Swartz							
OF:	1	TECHNICAL REVIEWER:		R. Turner							

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

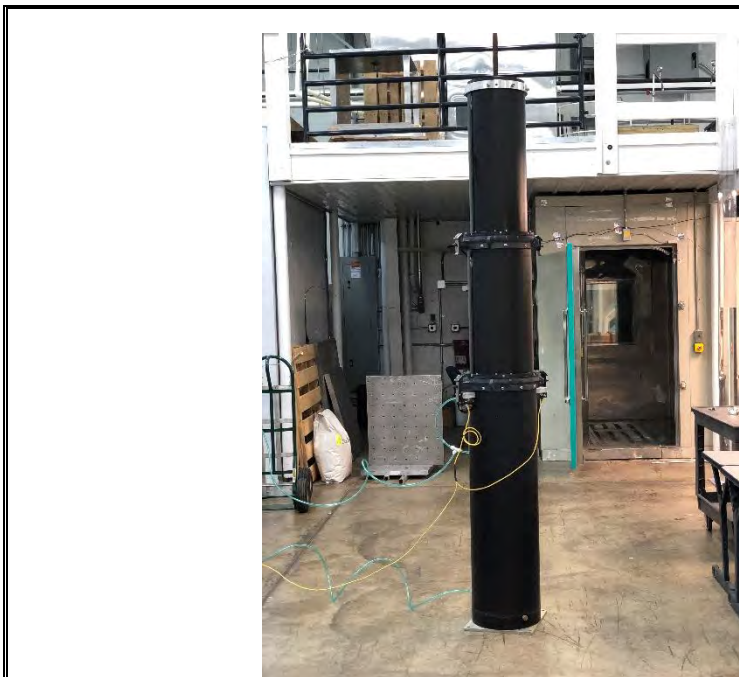
3.5.2 THERMAL SHOCK TEST PHOTOGRAPHS

	Thermal Shock	
	MIL-STD-810G	
	Test Setup Chamber 1	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	8/13/18 - 8/18/18
Job #:	1608-019NB-3	

	Thermal Shock	
	MIL-STD-810G	
	Test Setup Chamber 2	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	8/13/18 - 8/18/18
Job #:	1608-019NB-3	

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY


Thermal Shock	
MIL-STD-810G	
Response Location	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	8/13/18 - 8/18/18
Job #:	1608-019NB-3



Thermal Shock	
MIL-STD-810G	
Post Test Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	8/13/18 - 8/18/18
Job #:	1608-019NB-3

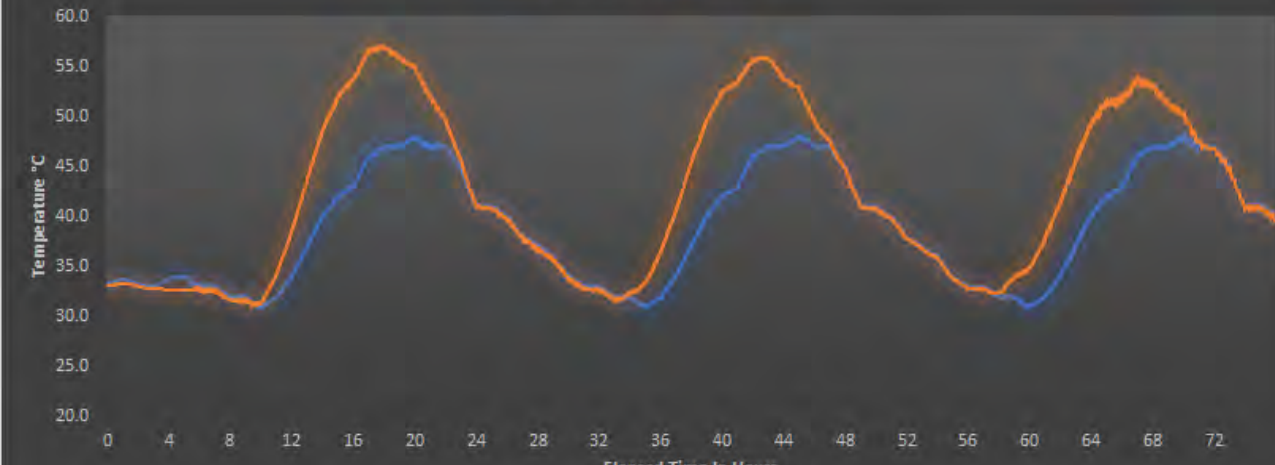
ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.6 SOLAR RADIATION TEST

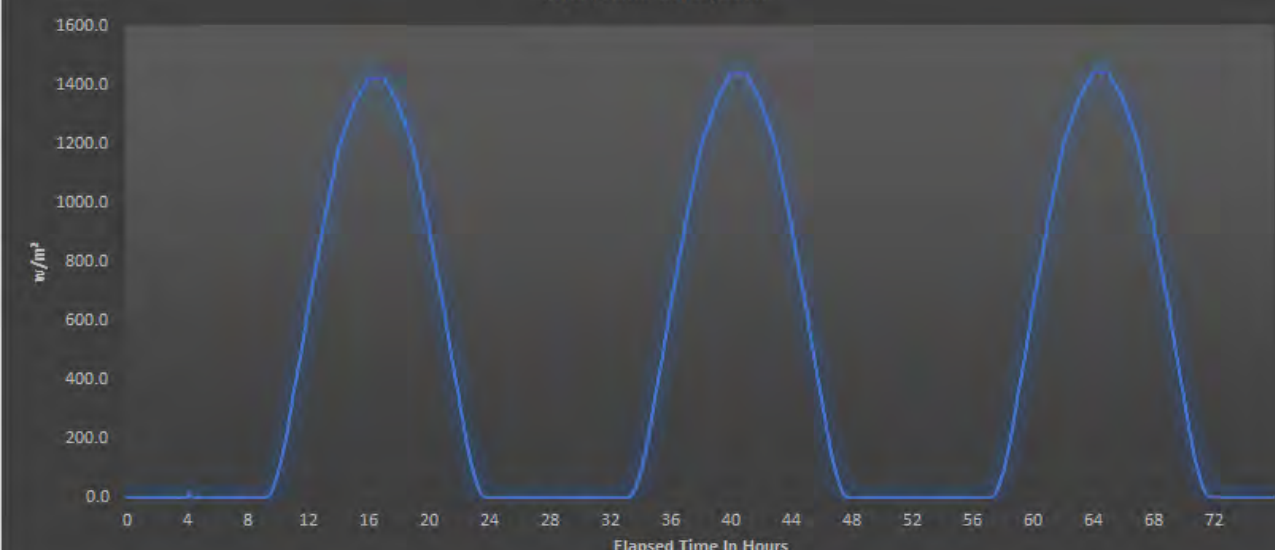
- a) The Solar Radiation requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The Solar Radiation Test Log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The Solar Radiation test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the Solar Radiation test on the UHD Pneumatic Mast is located in Paragraph 3.6.1 of this document.
- e) The Solar Radiation test photographs for the UHD Pneumatic Mast are located in Paragraph 3.6.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.6.1 SOLAR RADIATION TEST DATA

Solar Radiation Data Sheet					
EUT:	UHD Pneumatic Mast			Job Number:	1608-019NB-3
M/N:	N/A	P/N:	N/A	S/N:	N/A
Customer:	Will-Burt Company				
Date:	7/10/18 - 7/13/18			Test Engineer:	T. Swartz
Test Specifications					
Test Spec:	MIL-STD-810G			Para./Sec.:	505.1
Temperature Profile					
#1608-019NB The Wil-Burt Company MIL-STD-810G Method 505, Procedure I Solar Radiation (Temperature) 07/09/2018 - 07/12/2018 Chamber Air UUT Response					
					
Environmental Profile Information					
Test Cycle Begins At:	09:28 on 07/10/2018				
Test Cycle Ends At:	13:26 on 07/13/2018				
Total Number of Cycles:	3				
Test Duration:	72 hrs.				
Category:	A1				
EUT Test Information	Y	N	N/A	Comments	
Operating During Test:		X		Operating Mode:	N/A
Powered During Test:		X		V	A AC/DC
Physical Damage Noted:		X			
PAGE: 1	ENGINEER/TECHNICIAN(S): T. Swartz				
OF: 2	TECHNICAL REVIEWER: R. Turner				

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Solar Radiation Data Sheet					
EUT:	UHD Pneumatic Mast			Job Number:	1608-019NB-3
M/N:	N/A	P/N:	N/A	S/N:	N/A
Customer:	Will-Burt Company				
Date:	7/10/18 - 7/13/18			Test Engineer:	T. Swartz
Test Specifications					
Test Spec:	MIL-STD-810G			Para./Sec.:	505.1
Solar Load Profile					
#1608-019NB The Wil-Burt Company MIL-STD-810G Method 505, Procedure I Solar Radiation (Solar Load) 07/09/2018 - 07/12/2018					
					
Environmental Profile Information					
Test Cycle Begins At:	09:28 on 07/10/2018				
Test Cycle Ends At:	13:26 on 07/13/2018				
Total Number of Cycles:	3				
Test Duration:	72 hrs.				
Category:	A1				
EUT Test Information	Y	N	N/A	Comments	
Operating During Test:		X		Operating Mode:	N/A
Powered During Test:		X		V	A AC/DC
Physical Damage Noted:		X			
PAGE: 2	ENGINEER/TECHNICIAN(S): T. Swartz				
OF: 2	TECHNICAL REVIEWER: R. Turner				

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.6.2 SOLAR RADIATION TEST PHOTOGRAPHS



Solar Radiation	
MIL-STD-810G	
Test Setup	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	7/10/18 - 7/13/18
Job #:	1608-019NB-3



Solar Radiation	
MIL-STD-810G	
Post Test Pre-Inspection	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	7/10/18 - 7/13/18
Job #:	1608-019NB-3

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY



Solar Radiation	
MIL-STD-810G	
Post Test Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	7/10/18 - 7/13/18
Job #:	1608-019NB-3

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.7 RAIN TEST

- a) The Rain requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The Rain Test Log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The Rain test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the Rain test on the UHD Pneumatic Mast is located in Paragraph 3.7.1 of this document.
- e) The Rain test photographs for the UHD Pneumatic Mast are located in Paragraph 3.7.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.7.1 RAIN TEST DATA

Rain Data Sheet			
EUT:	UHD Pneumatic Mast		Job Number: 1608-019NB-3
M/N:	N/A	P/N: N/A	S/N: N/A
Customer:	Will-Burt Company		
Date:	7/17/18		Test Engineer: T. Swartz
Test Specifications			
Test Spec:	MIL-STD-810G		Para./Sec.: 506.5

Test Data

Typical Testing Set-Up	
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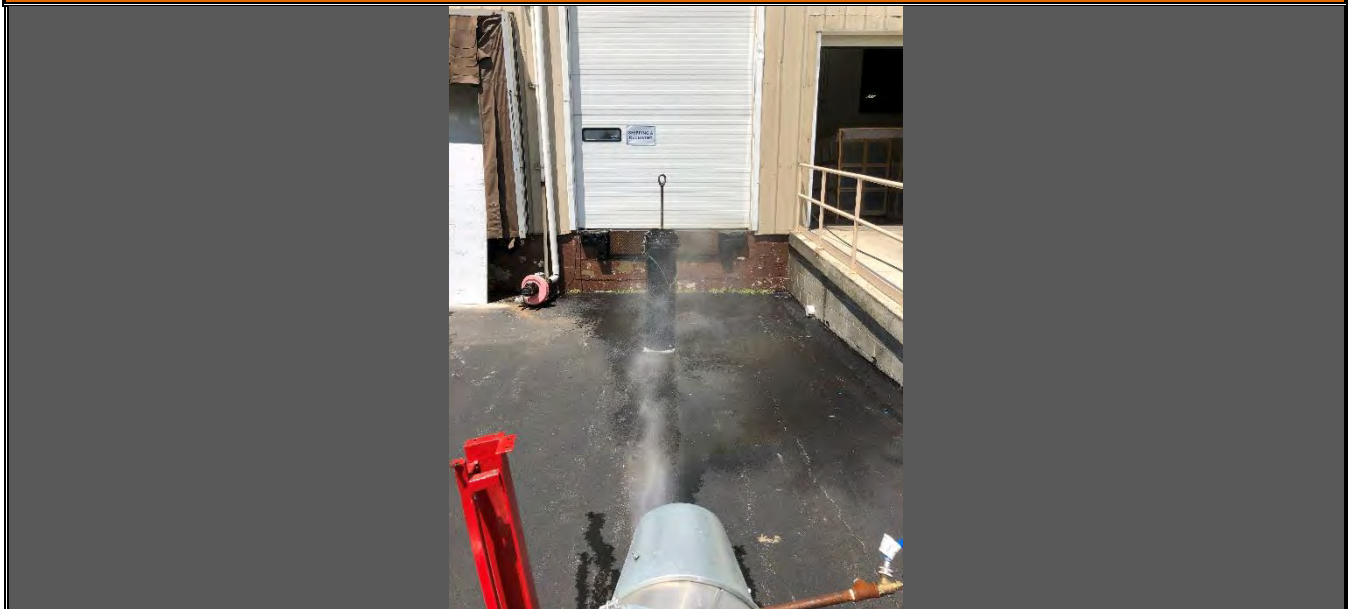
Environmental Profile Information	
Stream Size (inches):	5/8
Pressure (psi):	55
Sides Tested:	4
Duration:	3 minutes

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:	X			Operating Mode:					
Powered During Test:	X			V	N/A	A	N/A	AC/DC	N/A
Physical Damage Noted:		X							
Water Ingress Noted:		X							

PAGE: 1	ENGINEER/TECHNICIAN(S): T. Swartz
OF: 1	TECHNICAL REVIEWER: R. Turner

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY
Blowing Rain Data Sheet

EUT:	UHD Pneumatic Mast		Job Number:	1608-019NB-3	
M/N:	N/A	P/N:	N/A	S/N:	N/A
Customer:	Will-Burt Company				
Date:	7/17/18		Test Engineer:	T. Swartz	
Test Specifications					
Test Spec:	MIL-STD-810G		Para./Sec.:	506.5	


Test Data
Typical Testing Set-Up

Environmental Profile Information


Rain Flow(kPa):	5" per Hour				
Wind Speed:(mph):	40				
Sides Tested:	4				
Duration:	30 minutes				
EUT Test Information	Y	N	N/A	Comments	
Operating During Test:	X			Operating Mode:	Unit was operated for the last 10 minutes of each side tested.
Powered During Test:	X			V	N/A A N/A AC/DC N/A
Physical Damage Noted:		X			
Water Ingress Noted:		X			

PAGE: 1	ENGINEER/TECHNICIAN(s): T. Swartz
OF: 1	TECHNICAL REVIEWER: R. Turner

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.7.2 RAIN TEST PHOTOGRAPHS

	Rain	
	MIL-STD-810G	
	Rain Test Setup	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	7/17/18
	Job #:	1608-019NB-3

	Rain	
	MIL-STD-810G	
	Blowing Rain Test Setup	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	7/17/18
	Job #:	1608-019NB-3

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Rain	
MIL-STD-810G	
Post Test Inspection	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	7/17/18
Job #:	1608-019NB-3

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

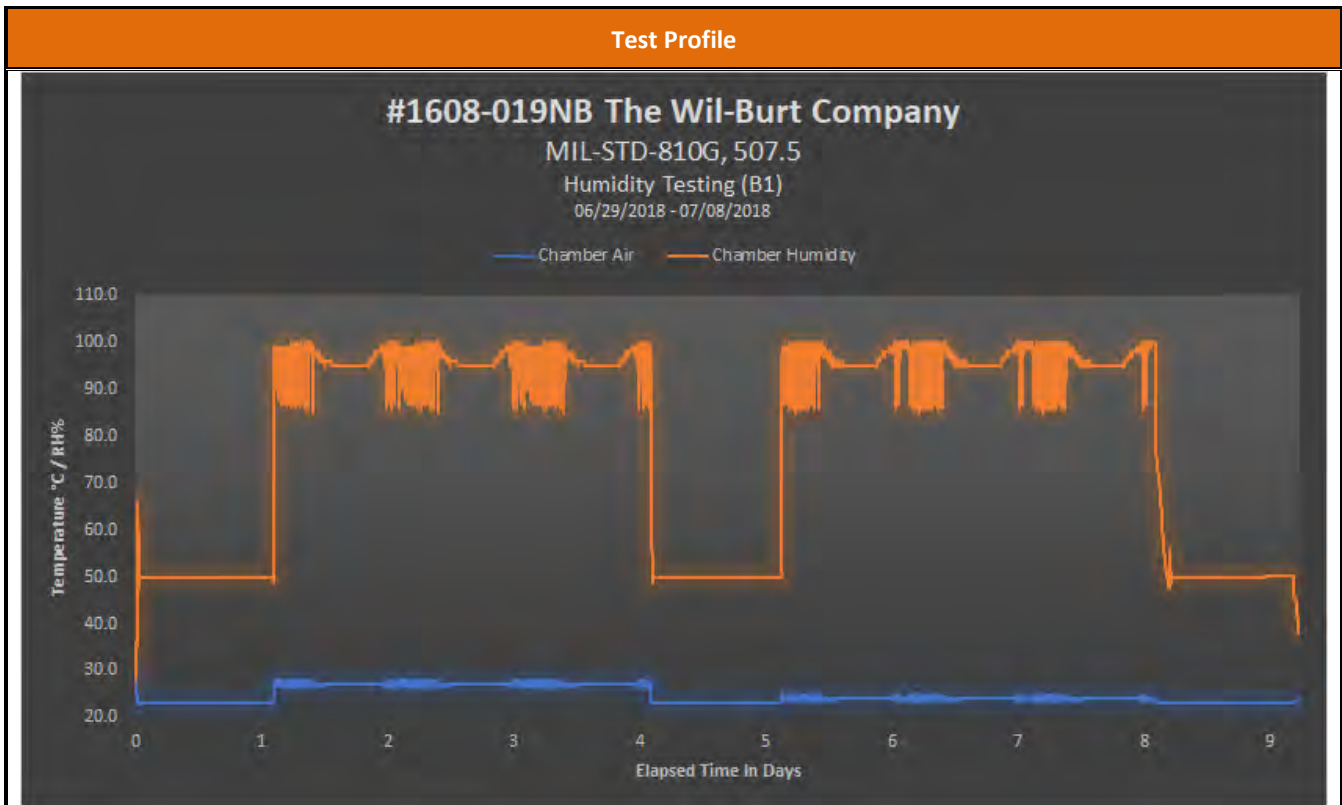
3.8 HUMIDITY TEST

- a) The HUMIDITY requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The HUMIDITY test log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The HUMIDITY test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the HUMIDITY test on the UHD Pneumatic Mast is located in Paragraph 3.8.1 of this document.
- e) The HUMIDITY test photographs for the UHD Pneumatic Mast are located in Paragraph 3.8.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.8.1 HUMIDITY TEST DATA

HUMIDITY Data Sheet			
EUT:	UHD Pneumatic Mast		Job Number: 1608-019NB-3
M/N:	N/A	P/N: N/A	S/N: N/A
Customer:	Will-Burt Company		
Date:	6/29/18 - 7/9/18		Test Engineer: T. Swartz
Test Specifications			
Test Spec:	MIL-STD-810G		Para./Sec.: 507.5

Test Data

Environmental Profile Information

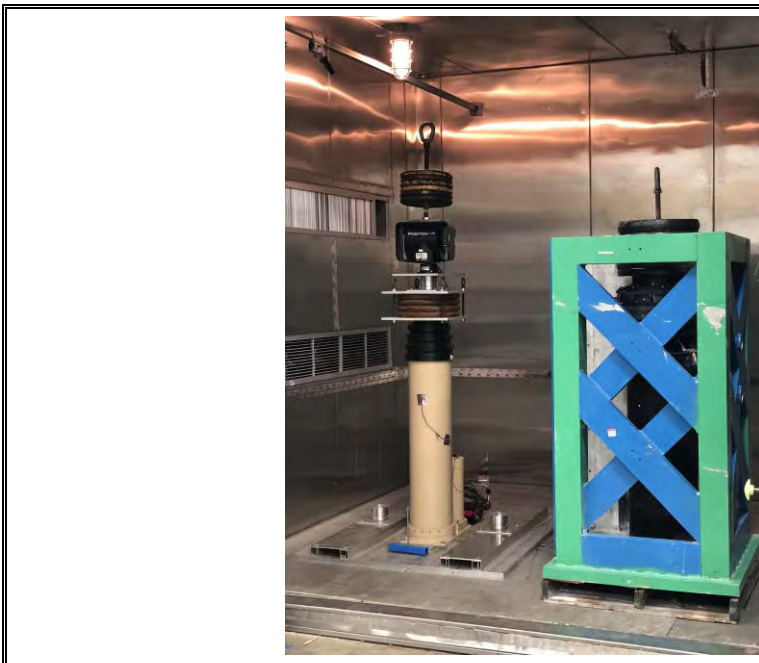
Test Cycle Begins At:	16:40 on 06/29/2018						
Test Cycle Ends At:	22:16 on 07/08/2018						
Total Number of Cycles:	6 (3 Cycles Induced / 3 Cycles Natural) per spec.						
Cycle Duration:	24						
EUT Test Information	Y	N	N/A	Comments			
Operating During Test:		X		Operating Mode:	N/A		
Powered During Test:		X		V	N/A	A	N/A
Physical Damage Noted:		X		Units were all tested (functionally) following testing.			
PAGE: 1	ENGINEER/TECHNICIAN(S): T. Swartz						
OF: 1	TECHNICAL REVIEWER: R. Turner						

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.8.2 HUMIDITY TEST PHOTOGRAPHS

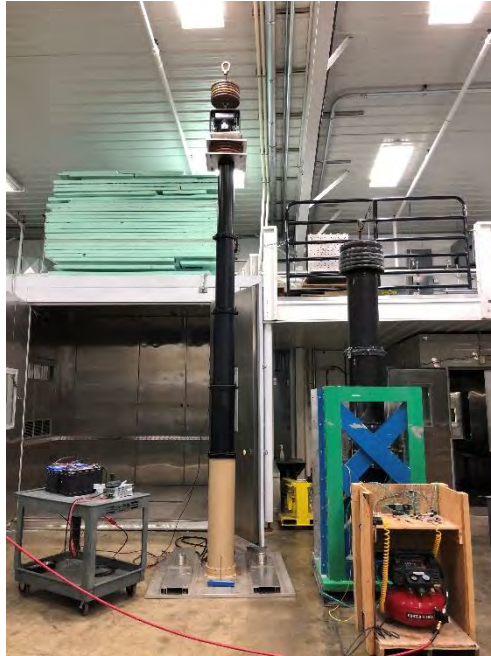

HUMIDITY	
MIL-STD-810G	
Test Setup	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/29/18 - 7/9/18
Job #:	1608-019NB-3



HUMIDITY	
MIL-STD-810G	
Post Test	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/29/18 - 7/9/18
Job #:	1608-019NB-3

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY



HUMIDITY	
MIL-STD-810G	
Post Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	6/29/18 - 7/9/18
Job #:	1608-019NB-3

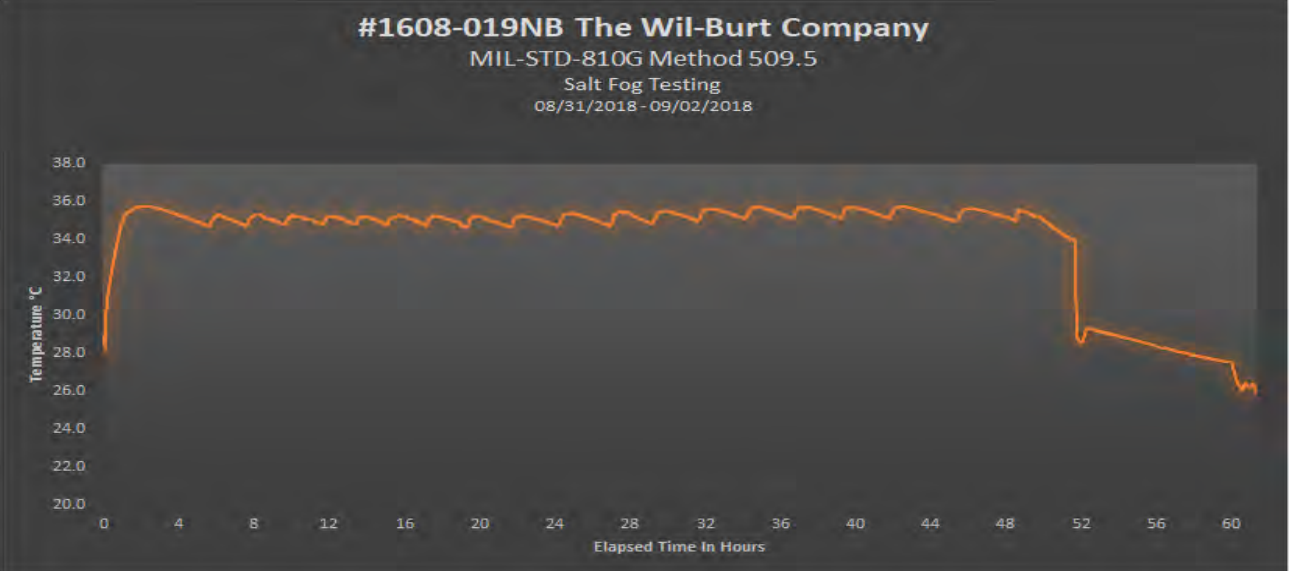
ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.9 SALT FOG TEST

- a) The Salt Fog requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The Salt Fog test log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The Salt Fog test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the Salt Fog test on the UHD Pneumatic Mast is located in Paragraph 3.9.1 of this document.
- e) The Salt Fog test photographs for the UHD Pneumatic Mast are located in Paragraph 3.9.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY


3.9.1 SALT FOG TEST DATA

Salt Fog Data Sheet											
EUT:	UHD Pneumatic Mast				Job Number:	1608-019NB-3					
M/N:	N/A		P/N:	N/A		S/N:	N/A				
Customer:	Will-Burt Company										
Date:	8/18/18 - 9/4/18				Test Engineer:	T. Swartz					
Test Specifications											
Test Spec:	MIL-STD-810G				Para./Sec.:	509.5					
Environmental Profile Information											
#1608-019NB The Wil-Burt Company MIL-STD-810G Method 509.5 Salt Fog Testing 08/31/2018 - 09/02/2018											
											
Test Cycle Begins At:	16:49 on 08/31/2018										
Test Cycle Ends At:	17:15 on 09/02/2018										
Samples Tested:	1										
Total Number of Cycles:	1										
Spray Duration:	48:00:00										
Post Spray Drying Duration:	48:00:00										
Salt Solution:	5%										
Temperature:	35°C										
Specific Gravity (g/cm ³):	1.030g/cm³										
pH Level:	6.9										
Fallout Rate (Per Hour):	1.68ml/hr										
Air Pressure:	16.60 psi										
EUT Test Information			Y	N	N/A	Comments					
Operating During Test:				X		Operating Mode:	Non-Operating				
Powered During Test:				X		V	N/A	A	N/A	AC/DC	N/A
PAGE: 1	ENGINEER/TECHNICIAN(S): T. Swartz										
OF: 1	TECHNICAL REVIEWER: R. Turner										

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.9.2 SALT FOG TEST PHOTOGRAPHS

	Salt Fog	
	MIL-STD-810G	
	Test Setup	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
Date:	8/18/18 - 9/4/18	
Job #:	1608-019NB-3	

	Salt Fog	
	MIL-STD-810G	
	Post Test (Pre-Drying)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
Date:	8/18/18 - 9/4/18	
Job #:	1608-019NB-3	

REPORT NO.: 1608-019NB-3
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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY


Salt Fog	
MIL-STD-810G	
Post Test (Pre-Drying)	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	8/18/18 - 9/4/18
Job #:	1608-019NB-3



Salt Fog	
MIL-STD-810G	
Post Test Functional Verification	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	8/18/18 - 9/4/18
Job #:	1608-019NB-3

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

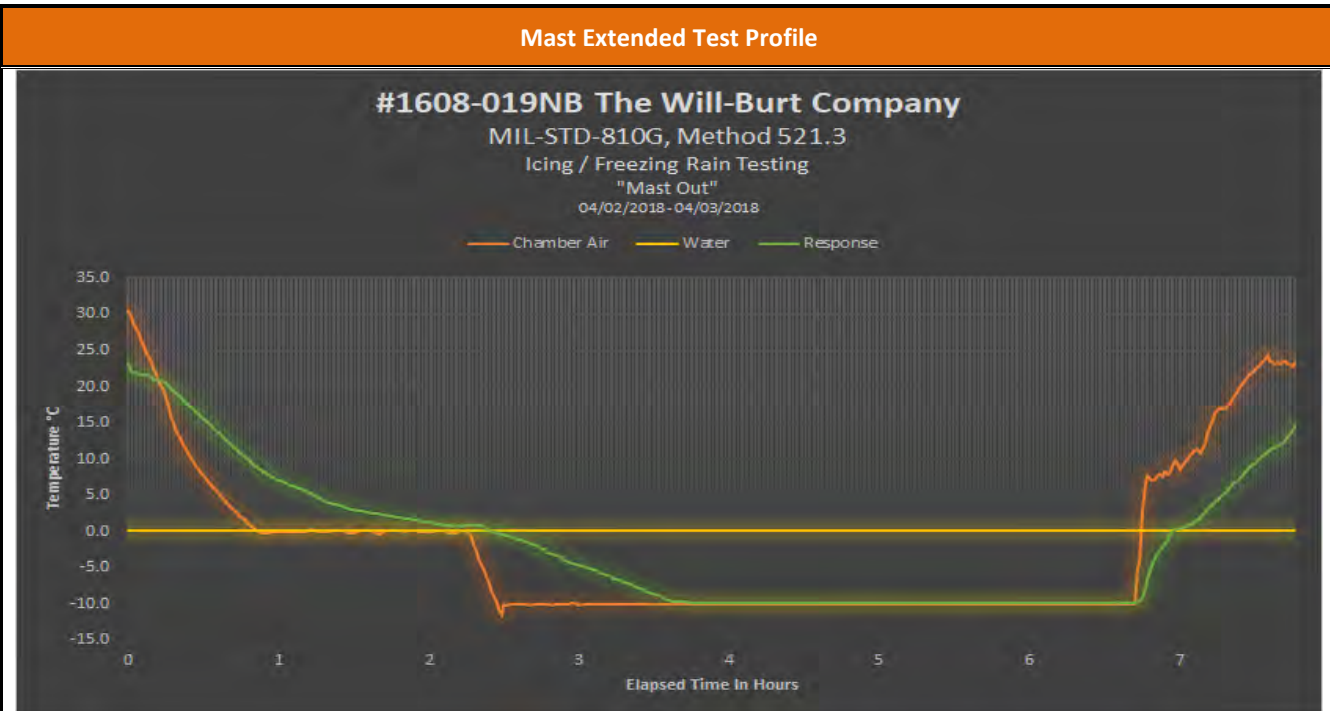
3.10 ICING/FREEZING RAIN TEST

- a) The Icing/Freezing Rain requirements for the UHD Pneumatic Mast are specified in MIL-STD-810G.
- b) The Icing/Freezing Rain test log for the UHD Pneumatic Mast is located in Paragraph 3.1 of this document.
- c) The Icing/Freezing Rain test equipment used to test the UHD Pneumatic Mast is located in Paragraph 3.2 of this document.
- d) All recorded test data for the Icing/Freezing Rain test on the UHD Pneumatic Mast is located in Paragraph 3.10.1 of this document.
- e) The Icing/Freezing Rain test photographs for the UHD Pneumatic Mast are located in Paragraph 3.10.2 of this document.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

3.10.1 ICING/FREEZING RAIN TEST DATA

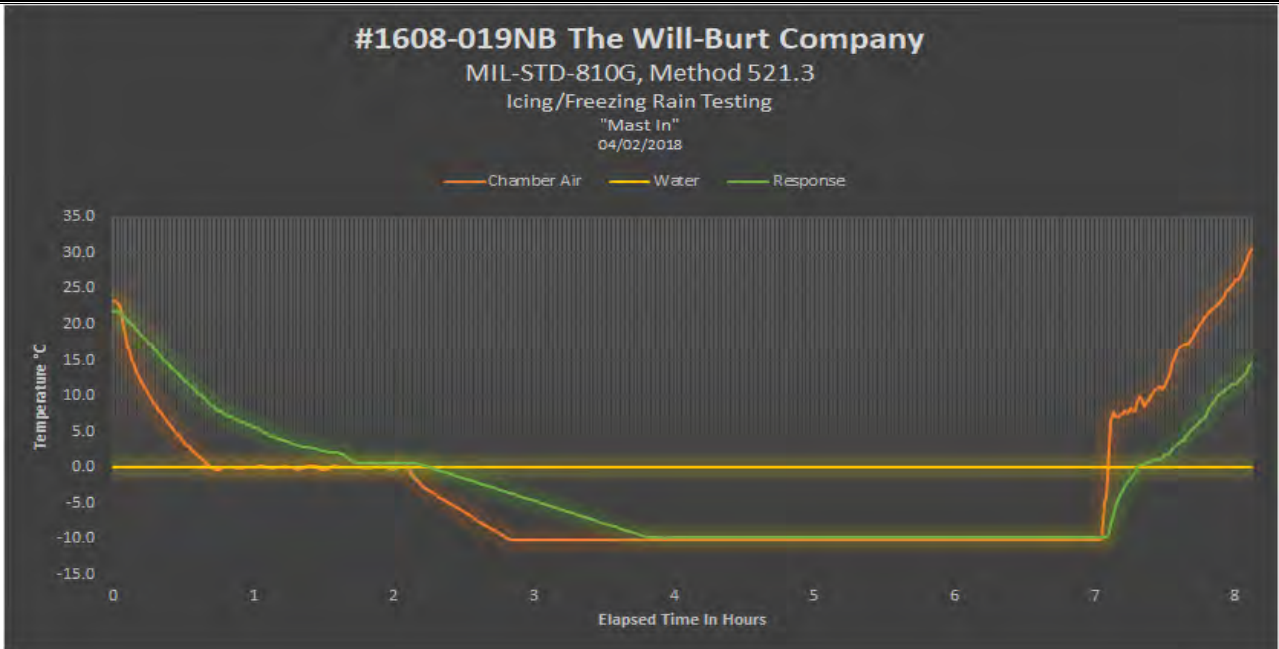
Icing/Freezing Rain Data Sheet			
EUT:	UHD Pneumatic Mast		Job Number: 1608-019NB-3
M/N:	N/A	P/N: N/A	S/N: N/A
Customer:	Will-Burt Company		
Date:	4/2/18 - 4/3/18		Test Engineer: T. Swartz
Test Specifications			
Test Spec:	MIL-STD-810G		Para./Sec.: 521.3

Test Data


Environmental Profile Information	
Test Cycle Begins At:	16:35 on 04/02/2018
Test Cycle Ends At:	00:30 on 04/03/2018
Total Number of Cycles:	1
Recommended Ice Thickness:	1/4"
Actual Ice thickness (build up):	7/16"
Water Temperature:	0.1°C
Water Delivery Rate:	25 mm/h
Ice Developed:	Glazed


PAGE: 1	ENGINEER/TECHNICIAN(s): T. Swartz
OF: 2	TECHNICAL REVIEWER: R. Turner


ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

Icing/Freezing Rain Data Sheet							
EUT:	UHD Pneumatic Mast			Job Number:	1608-019NB-3		
M/N:	N/A	P/N:	N/A	S/N:	N/A		
Customer:	Will-Burt Company						
Date:	4/2/18 - 4/3/18			Test Engineer:	T. Swartz		
Test Specifications							
Test Spec:	MIL-STD-810G			Para./Sec.:	521.3		
Mast In Test Profile							
 <p>#1608-019NB The Will-Burt Company MIL-STD-810G, Method 521.3 Icing/Freezing Rain Testing "Mast In" 04/02/2018</p> <p>— Chamber Air — Water — Response</p>							
Environmental Profile Information							
Test Cycle Begins At:	08:22 on 04/03/2018						
Test Cycle Ends At:	16:29 on 04/03/2018						
Total Number of Cycles:	1						
Recommended Ice Thickness:	1/4"						
Actual Ice thickness (build up):	3/8"						
Water Temperature:	0.1°C						
Water Delivery Rate:	25 mm/h						
Ice Developed:	Glazed						
EUT Test Information	Y	N	N/A	Comments			
Operating During Test:	Y			Operating Mode:	Powered On for functional evaluation.		
Powered During Test:	Y			V	12.6	A	AC/DC DC
Physical Damage Noted:		X		One unit is pneumatic powered, and the other units are DC powered.			
PAGE: 2	ENGINEER/TECHNICIAN(S): T. Swartz						
OF: 2	TECHNICAL REVIEWER: R. Turner						


ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY


3.10.2 ICING/FREEZING RAIN TEST PHOTOGRAPHS

	Icing/Freezing Rain	
	MIL-STD-810G	
	Test Setup (Mast Extended)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
Job #:	1608-019NB-3	

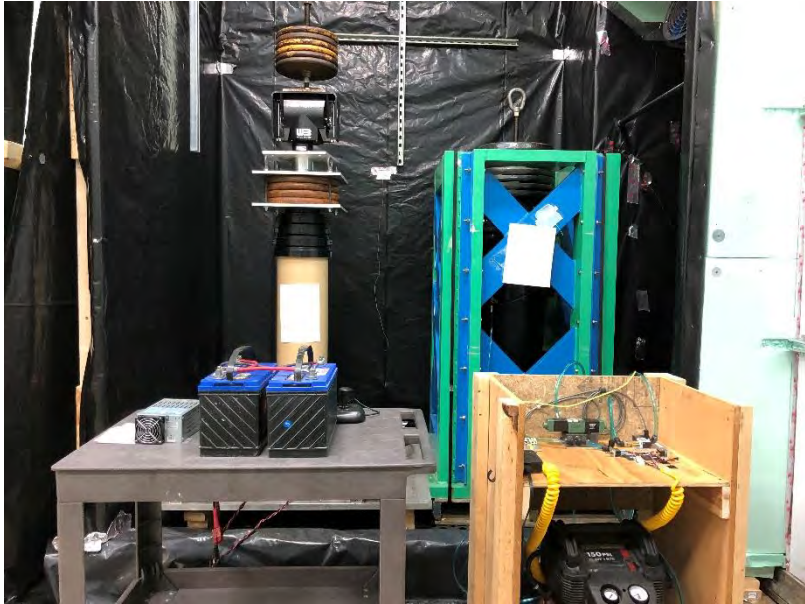
	Icing/Freezing Rain	
	MIL-STD-810G	
	Verification Location (Mast Extended)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
Job #:	1608-019NB-3	


REPORT NO.: 1608-019NB-3
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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

	Icing/Freezing Rain	
	MIL-STD-810G	
	Icing Verification (Mast Extended)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
	Job #:	1608-019NB-3

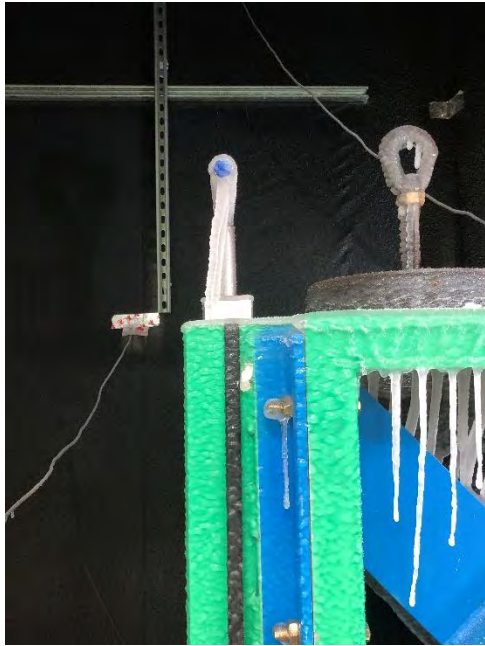
	Icing/Freezing Rain	
	MIL-STD-810G	
	Post Test Functional Verification (Mast Extended)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
	Job #:	1608-019NB-3


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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

	Icing/Freezing Rain	
	MIL-STD-810G	
	Test Setup (Mast In)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
	Job #:	1608-019NB-3

	Icing/Freezing Rain	
	MIL-STD-810G	
	Verification Location (Mast In)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
	Job #:	1608-019NB-3

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ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

	Icing/Freezing Rain	
	MIL-STD-810G	
	Icing Verification (Mast In)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
	Job #:	1608-019NB-3

	Icing/Freezing Rain	
	MIL-STD-810G	
	Icing Verification (Mast In)	
	Unit Tested	UHD Pneumatic Mast
	Model Number	N/A
	Part Number	N/A
	Serial Number	N/A
	Will-Burt Company	
	Date:	4/2/18 - 4/3/18
	Job #:	1608-019NB-3

REPORT NO.: 1608-019NB-3
REVISION: A

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY



Icing/Freezing Rain	
MIL-STD-810G	
Post Test Functional Verification (Mast In)	
Unit Tested	UHD Pneumatic Mast
Model Number	N/A
Part Number	N/A
Serial Number	N/A
Will-Burt Company	
Date:	4/2/18 - 4/3/18
Job #:	1608-019NB-3

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

SECTION 4 – CONCLUSION

- a) The UHD Pneumatic Mast, Model Number: N/A; Part Number: N/A; Serial Number: N/A, was subjected to the following Environmental Tests in accordance with MIL-STD-810G and the specifications as shown in Table 2:

TABLE 2 TESTS PERFORMED & RESULTS

Test Description	Results
High Temperature	No obvious signs of damage to UHD Pneumatic Mast, due to High Temperature testing conditions. UHD Pneumatic Mast met the criteria of the specification.
Low Temperature	No obvious signs of damage to UHD Pneumatic Mast, due to Low Temperature testing conditions. UHD Pneumatic Mast met the criteria of the specification.
Thermal Shock	No obvious signs of damage to UHD Pneumatic Mast, due to Thermal Shock testing conditions. UHD Pneumatic Mast met the criteria of the specification.
Solar Radiation	No obvious signs of damage to UHD Pneumatic Mast, due to Solar Radiation testing conditions. UHD Pneumatic Mast met the criteria of the specification.
Rain	No obvious signs of damage to UHD Pneumatic Mast, due to Rain testing conditions. UHD Pneumatic Mast met the criteria of the specification.
HUMIDITY	No obvious signs of damage to UHD Pneumatic Mast, due to HUMIDITY testing conditions. UHD Pneumatic Mast met the criteria of the specification.
Salt Fog	No obvious signs of damage to UHD Pneumatic Mast, due to Salt Fog testing conditions. UHD Pneumatic Mast met the criteria of the specification.
Icing/Freezing Rain	No obvious signs of damage to UHD Pneumatic Mast, due to Icing/Freezing Rain testing conditions. UHD Pneumatic Mast met the criteria of the specification.

- b) The UHD Pneumatic Mast was returned to Will-Burt Company after completion of the Environmental Test.

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY

APPENDIX A

PRE-TEST FUNCTIONAL VERIFICATION PHOTO

ENVIRONMENTAL TEST REPORT FOR WILL-BURT COMPANY





**Keystone Compliance, LLC
131 Columbus Inner Belt
New Castle, PA 16101**

**Phone: 724-657-9940
Fax: 724-657-9920**

The Will-Burt Company

1608-019NB



ENVIRONMENTAL TEST REPORT 1608-019NB REV. A

TEST STANDARDS: MIL-STD-810G

For

THE WILL-BURT COMPANY

169 SOUTH MAIN STREET
ORRVILLE, OH 44667

On

STILETTO AL, PNEUMATIC MAST WITH REMOTE LOCKING SYSTEM, POSITIONIT

PERFORMED BY: KEYSTONE COMPLIANCE, LLC.
131 COLUMBUS INNER BELT
NEW CASTLE, PA 16101

Keystone Compliance, LLC. does hereby certify that all inspections and tests have been performed in accordance with the documents referenced herein with exceptions as noted in this report. The results in this report pertain to the specified equipment tested. This report shall not be reproduced, except in full, without the written authorization of Keystone Compliance, LLC.

Prepared By:

Antietta Hallowich

ANTONIETTA HALLOWICH, Technical Writer

Date: 10/1/2018

Approved By:

Robert C. Turner

ROBERT TURNER, Environmental Lab Manager

Date: 10/1/2018

Approved By:

Joey Sullivan

JOEY SULLIVAN, Quality Manager

Date: 10/1/2018

Testing Services

www.keystonecompliance.com

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY

DOCUMENT HISTORY

Revision	Issue Date	Description Of Modifications	Revised By	Approved By
N/C	9/20/2018	Initial release	N/A	R.T.
A	10/1/2018	Revised Product Description	CP	RT

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY

CLIENT INFORMATION

Purchase Order Quote Number	MDWX001047 1608-019NB
Company Name Address City, State Zip	The Will-Burt Company 169 South Main Street Orrville, OH 44667
Contact Name Phone Email	Andrew Wasson 330-684-4031 AWasson@willburt.com

LABORATORY INFORMATION

Contact Name Title E-Mail Address	Robert Turner Environmental Lab Manager bob@keystonecompliance.com
--	---

TEST PROGRAM INFORMATION

Test Facility	E-Labs
Test Title & Test Dates	Altitude, Vibration, Shock, Sand and Dust -- May 2, 2018 to June 1, 2018



131 Columbus Inner Belt • New Castle • PA 16101
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www.keystonecompliance.com

REPORT NO.: 1608-019NB
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ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY

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ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY

3.1.1 E-LABS REPORT



ENVIRONMENTAL TEST REPORT
No. 5794-C

for

Altitude, Vibration, Shock, Sand, and Dust

applied to

Telescoping Masts

in accordance with

MIL-STD-810G
Dated: 31 October 2008

Submitted to:

Keystone Compliance
131 Columbus Inner Belt
New Castle, PA 16101

Customer PO#: 32618-01


Report Date: 12 June 2018

Pages: 52

Approved By:

Reviewed By:

Prepared by:



Kenneth C. Malley, Jr.
CEO
E-LABS, Inc.
www.e-labsinc.com



Carl L. Moran
Lab Manager
E-LABS, Inc.



Zach Miller
Lead Technician
E-LABS, Inc.

The data and information contained in this report are the result of independent testing and assessment conducted upon articles selected and provided to E-LABS Inc. by the customer. Neither E-LABS nor its subcontractor(s) makes any representation, expressed or implied, as to the suitability or adequacy of the opinions and results presented within pertaining to the efficiency, performance, reliability, or any other characteristic of the articles tested. This report should not be considered or used as an endorsement or recommendation of the suitability of the articles for purchase or intended use.

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

EXECUTIVE SUMMARY

E-LABS Incorporated performed Altitude, Vibration, Shock, Sand, and Dust Tests on Telescoping Masts for Keystone Compliance. The Telescoping Masts which will be known as Equipment Under Test (EUT) throughout this report are identified in *Table ES-1*.

Testing was performed from 2 May 2018 through 1 June 2018. The sequence of the testing that was performed is listed in *Table ES-2*. All testing was performed at and under the control of E-LABS Laboratory, 5150 Lad Land Drive, Fredericksburg, VA 22407.

A summary of results of testing are presented in *Table ES-3: Test Summary* and in more detail in *Section 5.2*.

Table ES-1: Equipment Under Test

EUT Number	EUT Description	Part Number	Serial Number
1	Electronic Mast	N/A	45631
2	Pneumatic Mast	N/A	N/A
3	PositionIt	N/A	N/A

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

Table ES-2: Tests Applied to Equipment Under Test

Test Applied	Procedure
Altitude	MIL-STD-810G Method 500.6 Procedure I and II
Dust	MIL-STD-810G Method 510.6 Procedure I
Sand	MIL-STD-810G Method 510.6 Procedure II
Vibration	MIL-STD-810G Method 514.6 Procedure I Category 20
Shock	MIL-STD-810G Method 516.6 Procedure I

Table ES-3: Test Summary

Test Number	Date	Test	EUT	Results
1	2May18	Vibration and Shock	1&2	No Anomalies
2	8May18	Altitude	1-3	No Anomalies
3	14May18	Sand	1-3	No Anomalies
4	25May18	Dust	1-3	No Anomalies

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

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TEST SUMMARY	4
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ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

1. INTRODUCTION

Keystone Compliance contracted test services for environmental testing with E-Labs. Keystone Compliance provided the EUT, specifications and personnel for performing operational tests.

This report documents the preparations, set-up, methods, and results for the tests performed.

2. TEST FACILITY

Testing was performed by E-LABS, Inc. [www.e-labsinc.com] at its laboratory facility located at 5150 Lad Land Drive in Fredericksburg, Virginia 22407.

3. EQUIPMENT UNDER TEST

The EUT was received at E-LABS on 1 May 2018 in 'No Visual Damage' condition.

4. TEST REQUIREMENTS [Applicable Documents (AD)]

Testing of the EUT was conducted in accordance with:

AD-1: E-Labs Quotation Number 05794-C, dated 26 January 2018

AD-2: MIL-STD-810G, dated 31 October 2008

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY


 REPORT No. 5794-C
 13 June 2018

5. TESTING
5.1 Preparation

The EUT was sequenced for testing as detailed above in Table ES-3. All equipment used for accuracy and data recording was calibrated with traceability to the National Institute of Standards and Technology reference standards. See Table 5.1-1 for a list of equipment used and calibration dates.

Table 5.1-1: Equipment and Calibration Data

<i>Instrument</i>	<i>Model No.</i>	<i>Serial No.</i>	<i>Manufacturer</i>	<i>Calibration Date</i>	<i>Calibration Due Date</i>
Vibration and Shock					
Vibration Controller	E1421B	US36002619	M+P International	9/4/17	9/4/18
Signal Conditioner	483B07	428	PCB	5/25/17	5/25/18
Accelerometer	353B04	144268	PCB	10/20/17	10/20/18
Accelerometer	353B04	144267	PCB	11/15/17	11/15/18
Accelerometer	353B04	LW154836	PCB	8/8/17	8/8/18
Altitude					
Pressure Gauge	DPI104	3824873	Druck	11/6/17	11/6/18
Data Logger	2625	6208300	Fluke	7/4/17	7/4/18
Sand and Dust					
Data Logger	2635A	6543601	Fluke	8/2/17	8/2/18
Particle Counter	CEL-712	4139439	Casella	11/29/17	11/29/18
Humidity Probe	HM141	X3340066	Vaisala	12/28/17	12/28/18
Scale	T51P	B231164740	Ohaus	1/21/18	1/21/19
Anemometer	471B-1	00AW7X	Dwyer	11/13/17	11/13/18

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



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5.2 Description of Testing

5.2.1 Vibration and Shock

Parameters:

- A) US Highway Truck Vibration
 - a. Two hours per axis in three axes
 - b. EUT stowed throughout
- B) Shock
 - a. 40g 11ms Sawtooth
 - b. 3 Positive and 3 Negative pulses per axis in 3 axes
 - c. EUT stowed throughout

Procedures:

- Step 1) EUT 1 was mounted in the Transverse Axis.
- Step 2) The US Highway Truck Transverse vibration profile was run for two hours.
- Step 3) At the completion of vibration, three positive and three negative shock pulses were performed.
- Step 4) Steps 1 – 3 were repeated for the Longitudinal and Vertical Axis on EUT 1.
- Step 5) EUT 2 was mounted in the Vertical Axis with the payload attached.
- Step 6) The US Highway Truck Vertical vibration profile was run for two hours.
- Step 7) At the completion of vibration, three positive and three negative shocks were performed.
- Step 8) Steps 5 – 7 were repeated for the Transverse and Longitudinal Axis on EUT 2. NOTE: The payload was removed for these two axes.

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

Results:

Neither EUT showed any signs of damage as a result of testing and performed as intended afterward.

See Photos 5.2.1-1 thru 5.2.1-6 for the test setup

See Chart 5.2.1-7 thru 5.2.1-12 for the test profiles

ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

Photo 5.2.1-1: EUT 1 Transverse Axis



Photo 5.2.1-2: EUT 1 Longitudinal Axis



ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

Photo 5.2.1-3: EUT 1 Vertical Axis



Photo 5.2.1-4: EUT 2 Vertical Axis



ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



REPORT No. 5794-C
13 June 2018

Photo 5.2.1-5: EUT 2 Transverse Axis



Photo 5.2.1-6: EUT 2 Longitudinal Axis

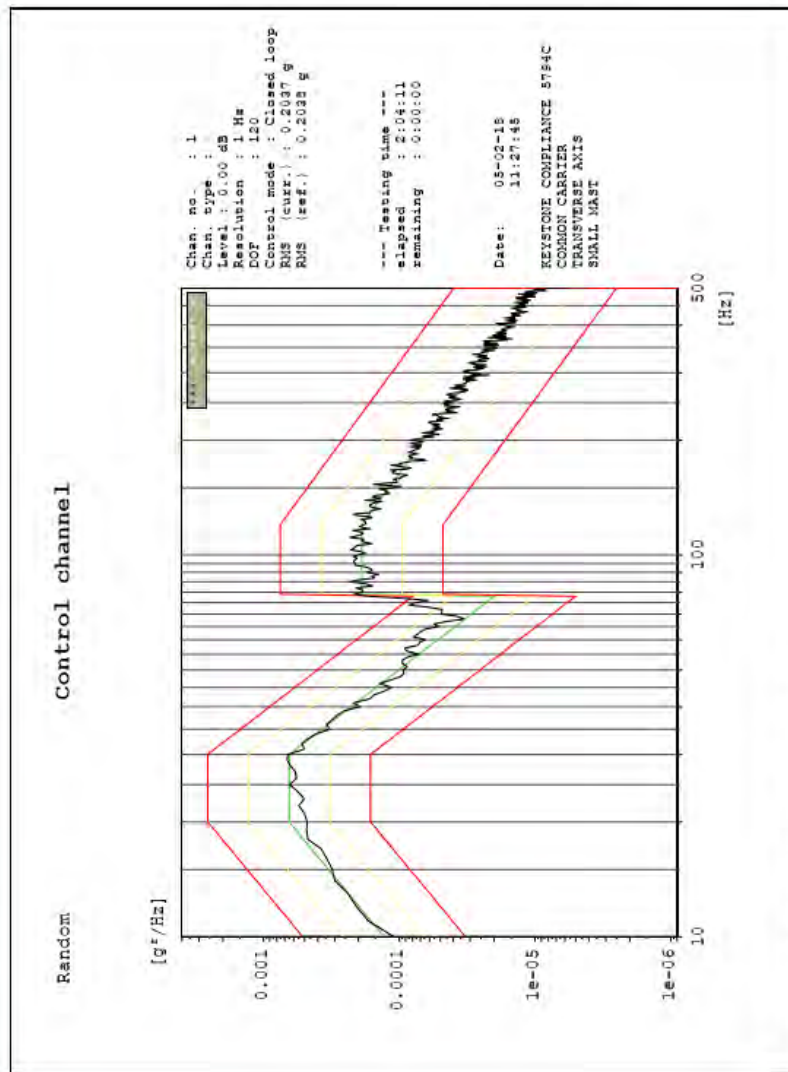


ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



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Chart 5.2.1-7: EUT 1 Transverse Axis



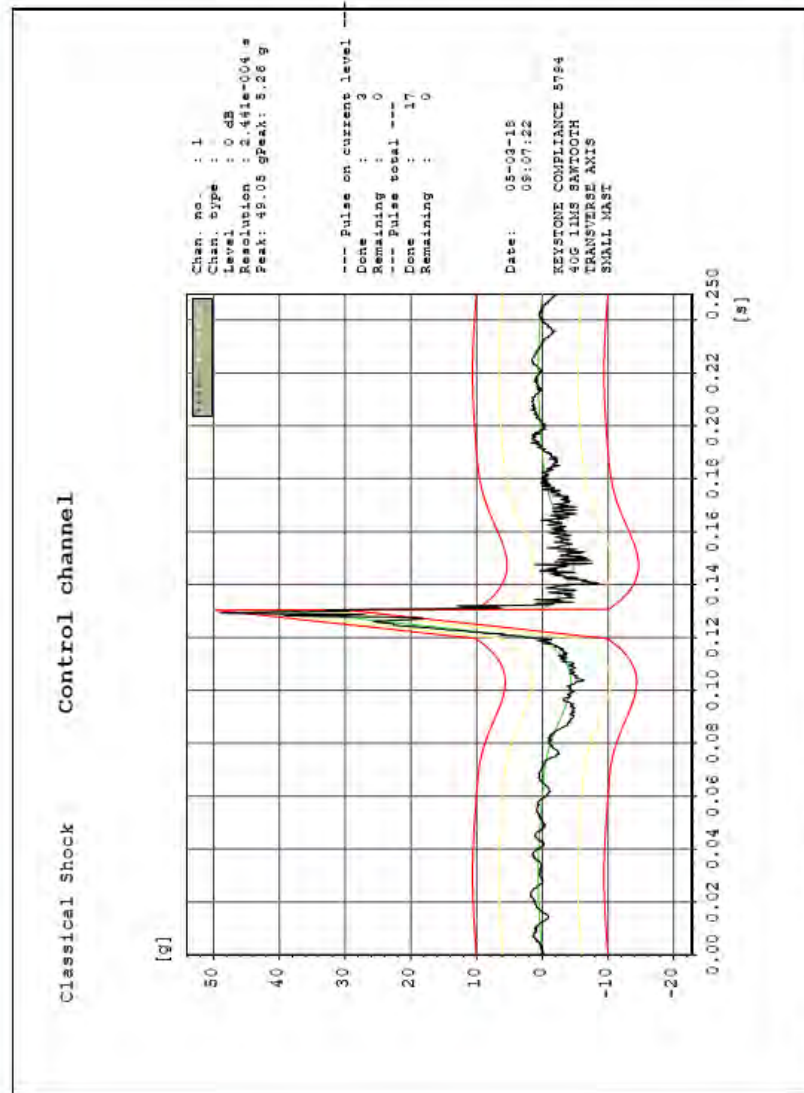
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ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



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Chart 5.2.1-8: EUT 1 Transverse Axis Positive Shock

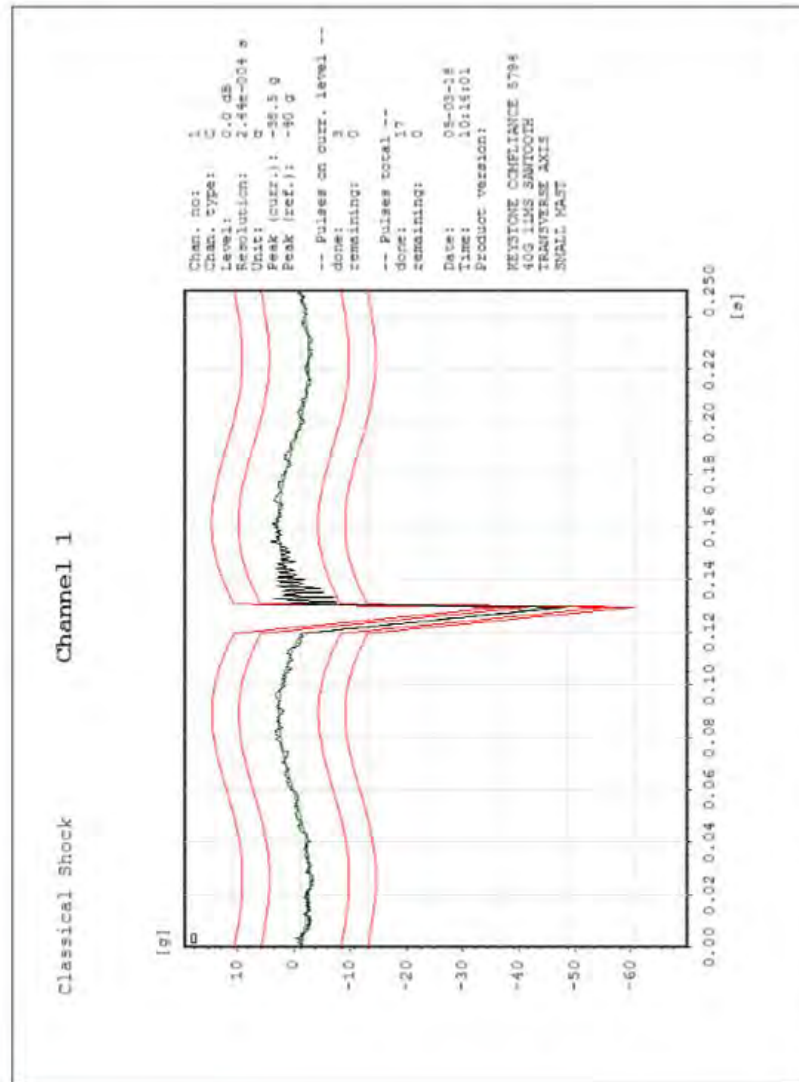


ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



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Chart 5.2.1-9: EUT 1 Transverse Axis Negative Shock



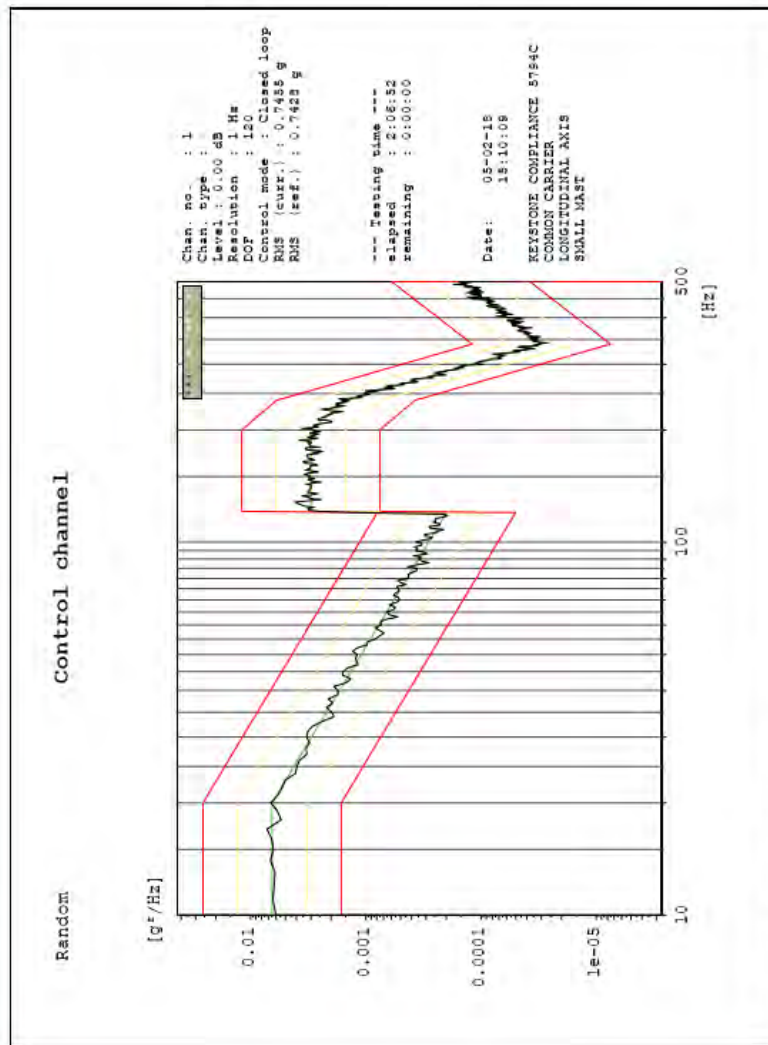
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ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



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Chart 5.2.1-10: EUT 1 Longitudinal Axis

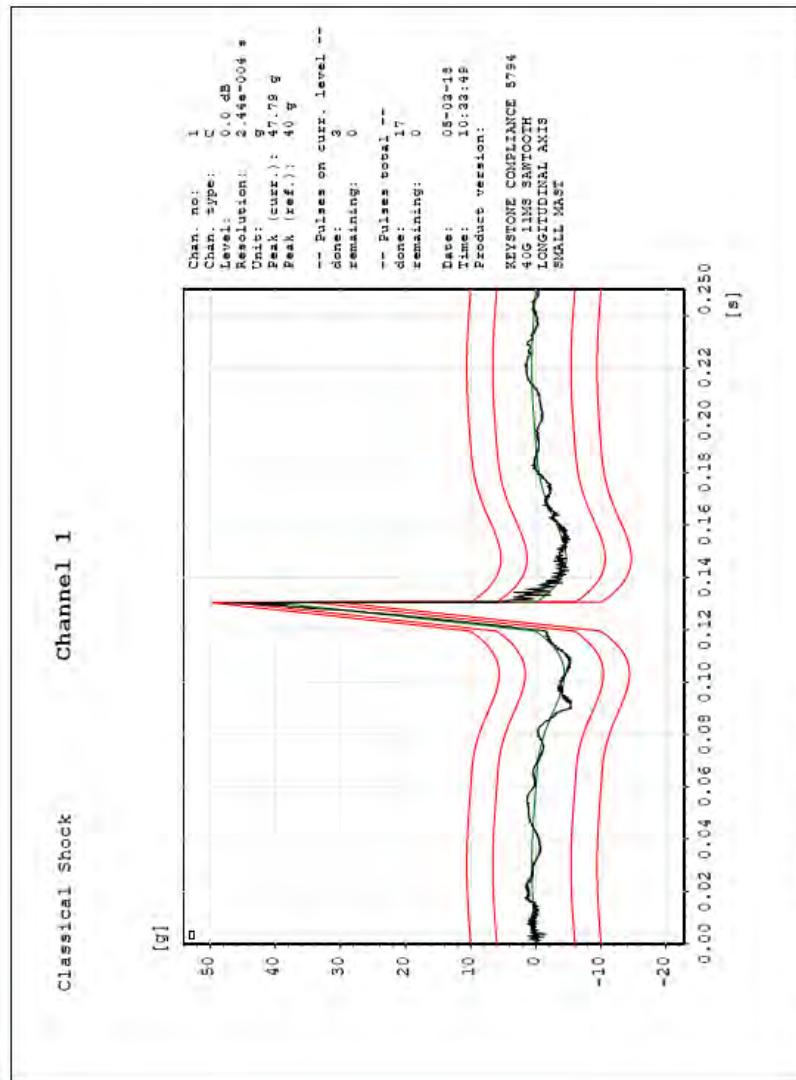


ENVIRONMENTAL TEST REPORT FOR THE WILL-BURT COMPANY



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Chart 5.2.1-11: EUT 1 Longitudinal Axis Positive Shock

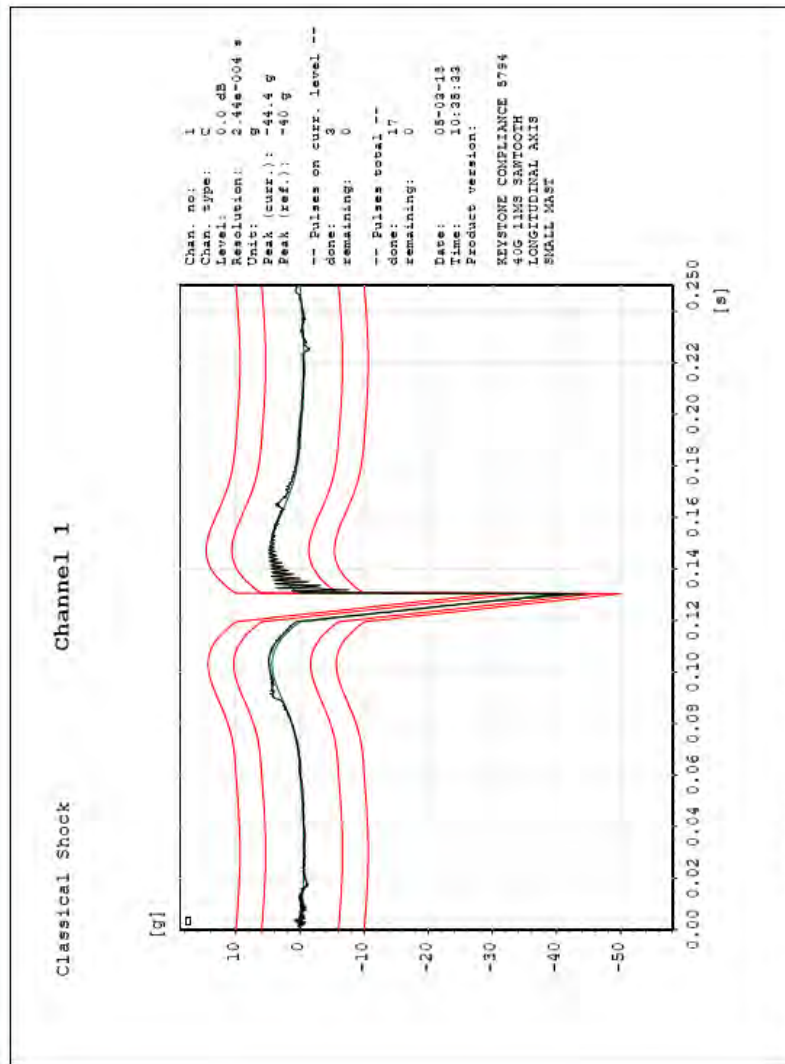


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Chart 5.2.1-12: EUT 1 Longitudinal Axis Negative Shock

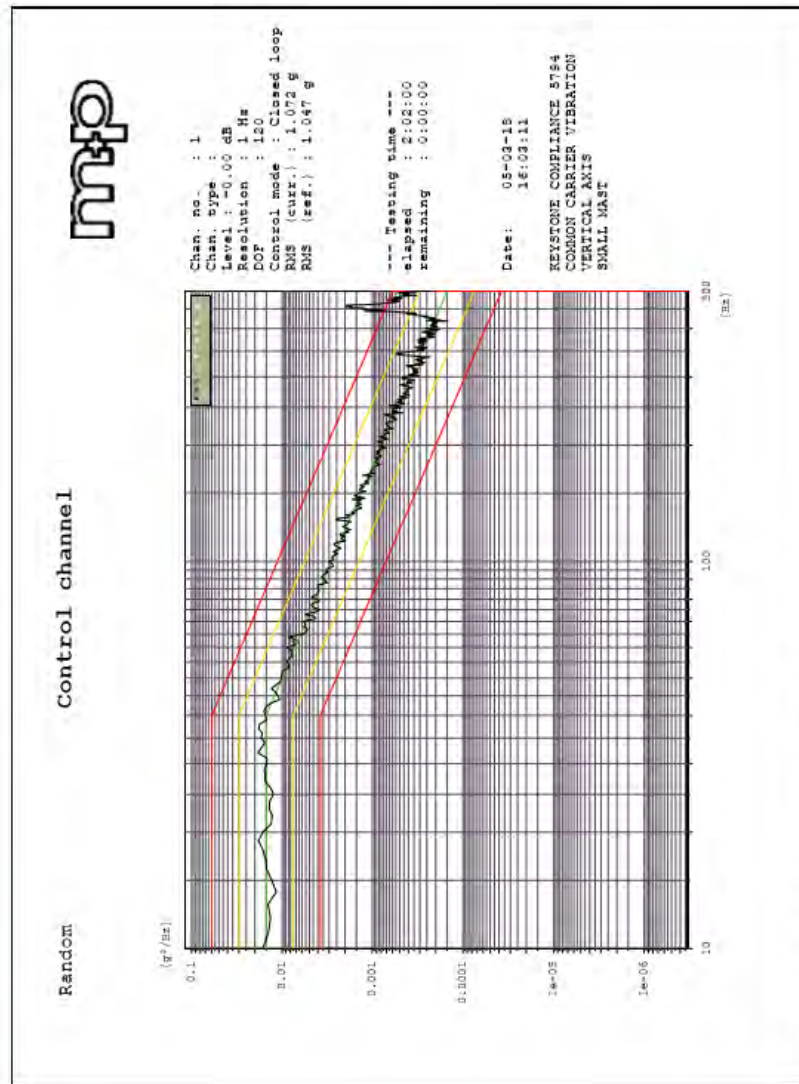


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Chart 5.2.1-13: EUT 1 Vertical Axis

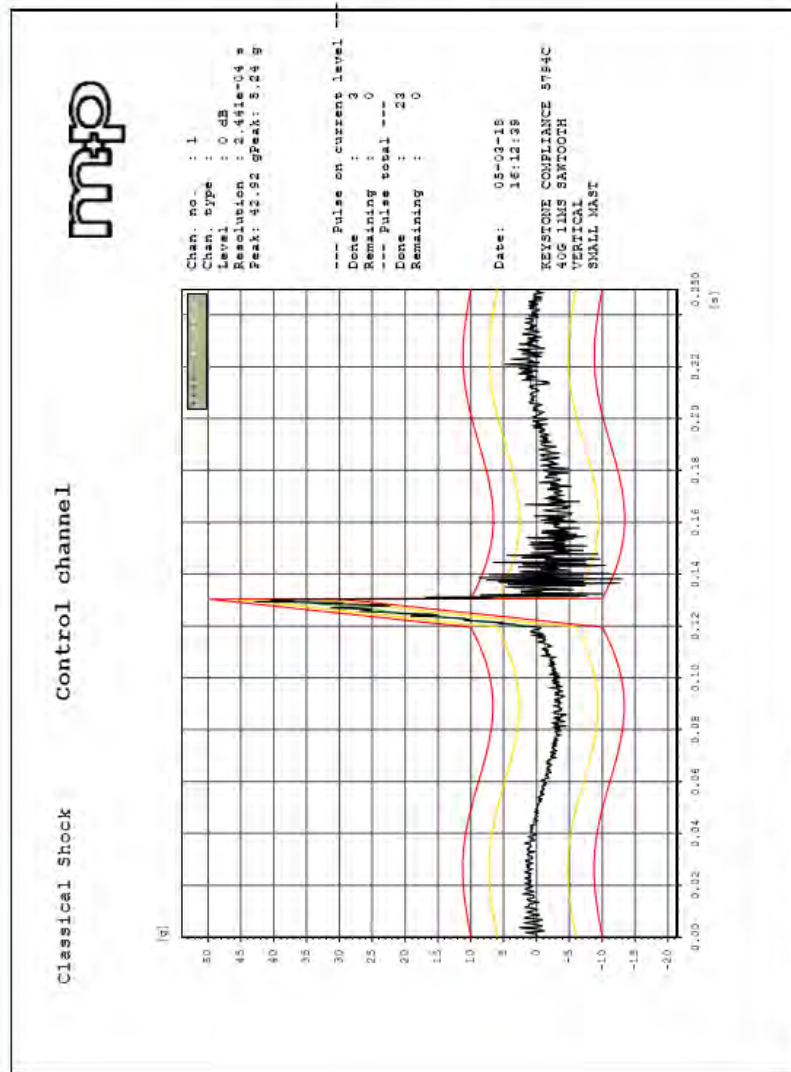


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Chart 5.2.1-14: EUT 1 Vertical Axis Positive Shock

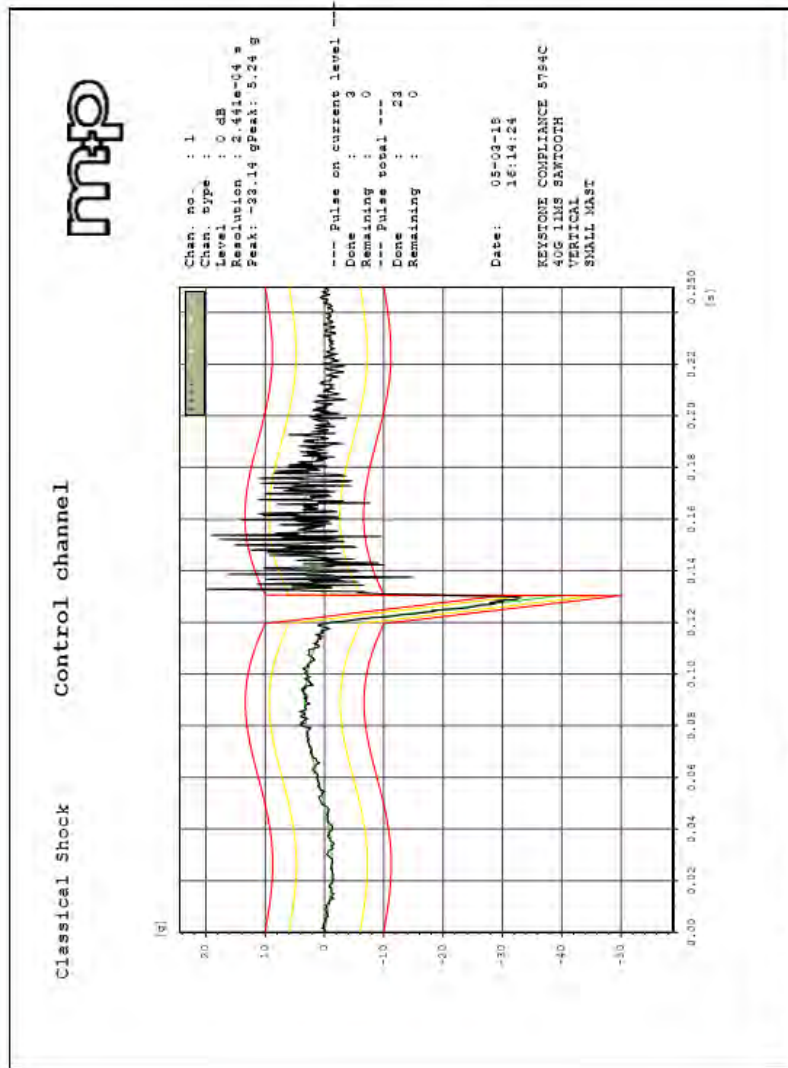


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Chart 5.2.1-15: EUT 1 Vertical Axis Negative Shock

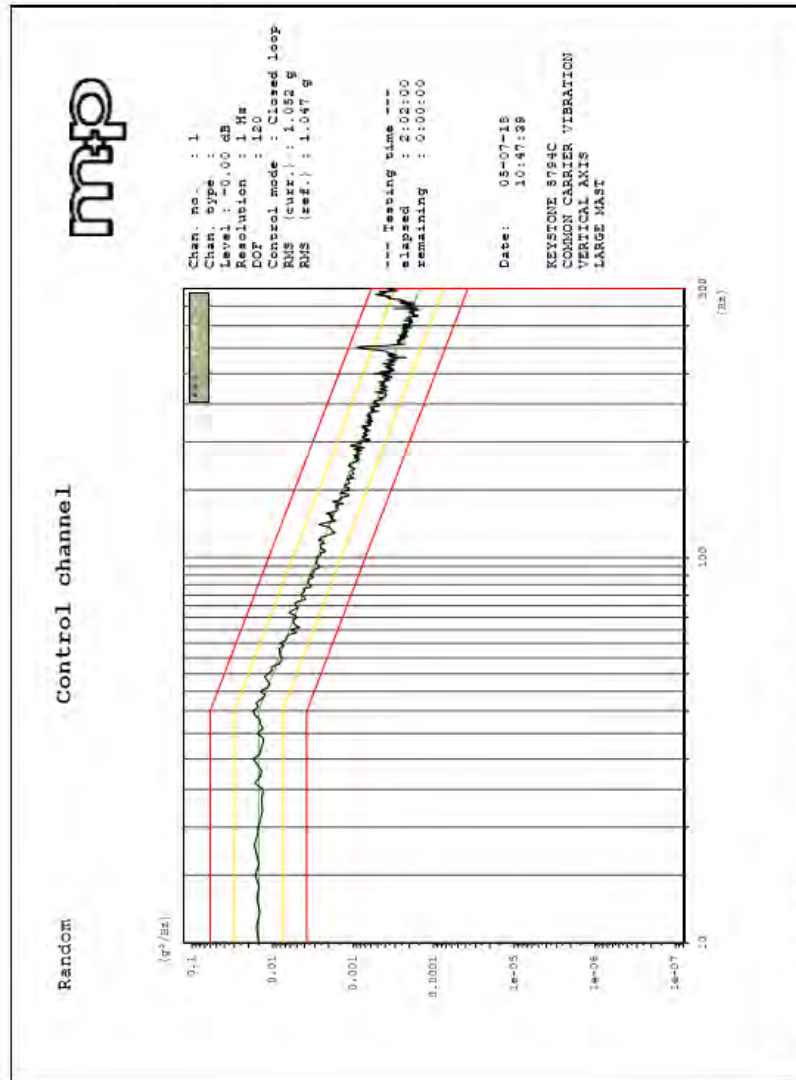


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Chart 5.2.1-16: EUT 2 Vertical Axis

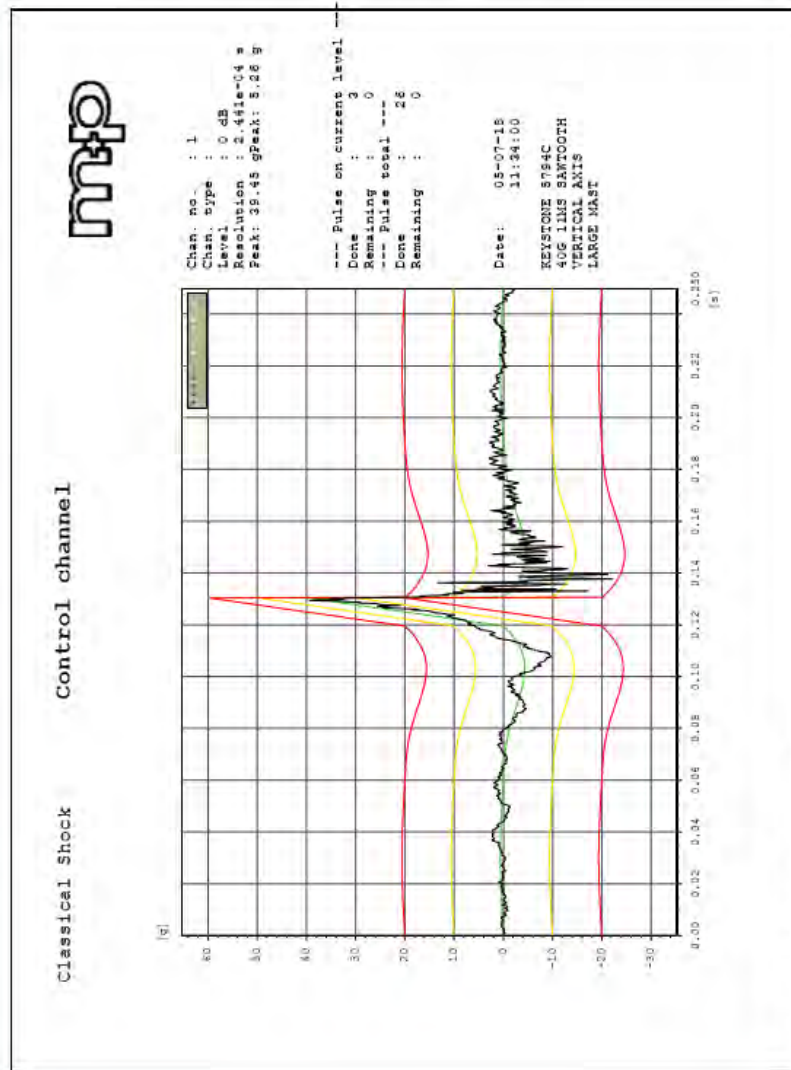


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Chart 5.2.1-17: EUT 2 Vertical Axis Positive Shock

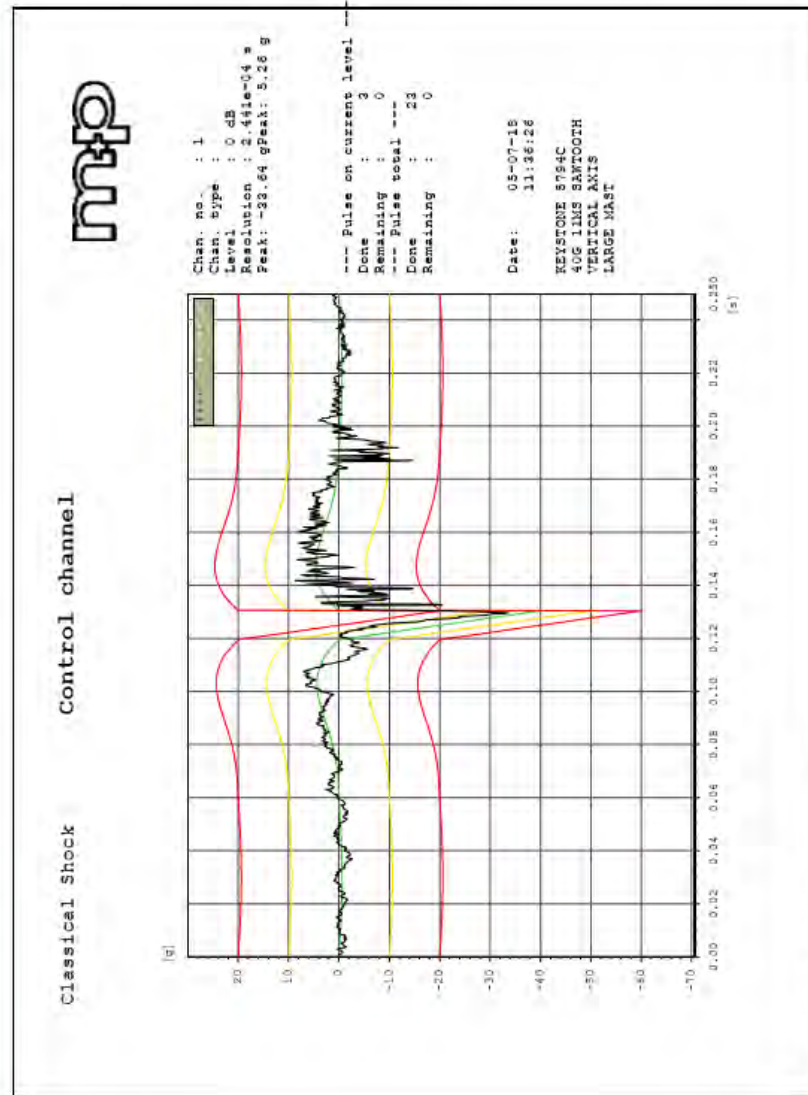


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Chart 5.2.1-18: EUT 2 Vertical Axis Negative Shock

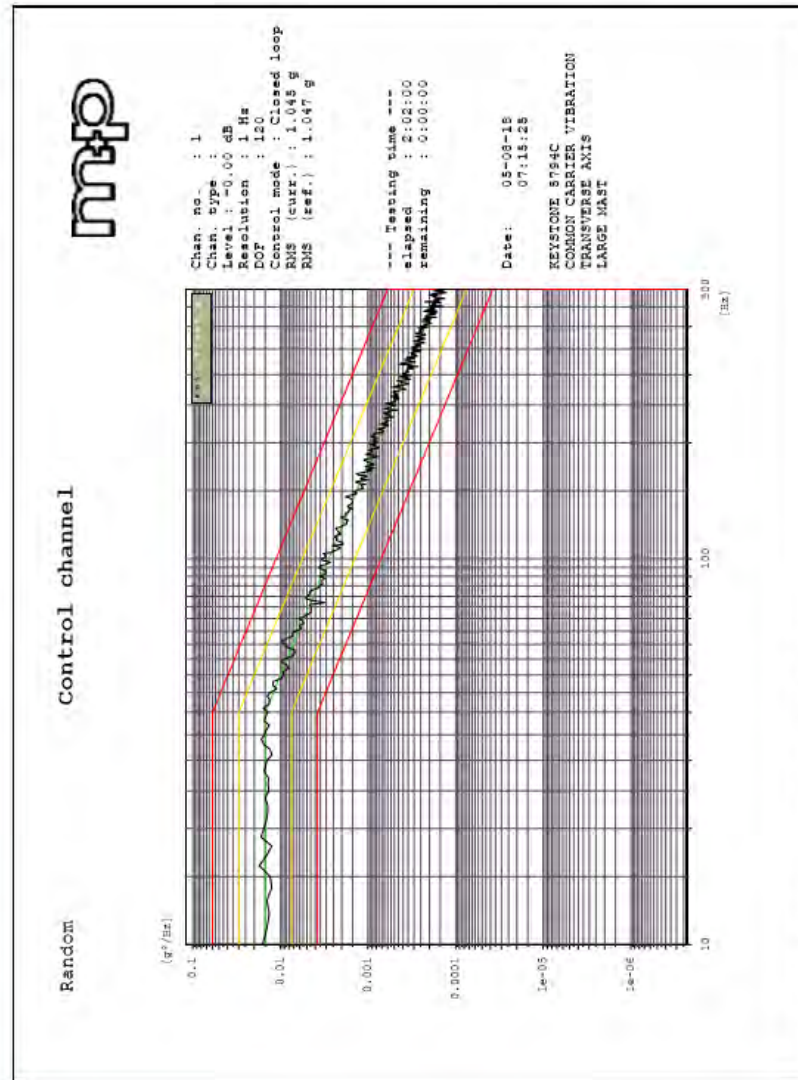


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Chart 5.2.1-19: EUT 2 Transverse Axis

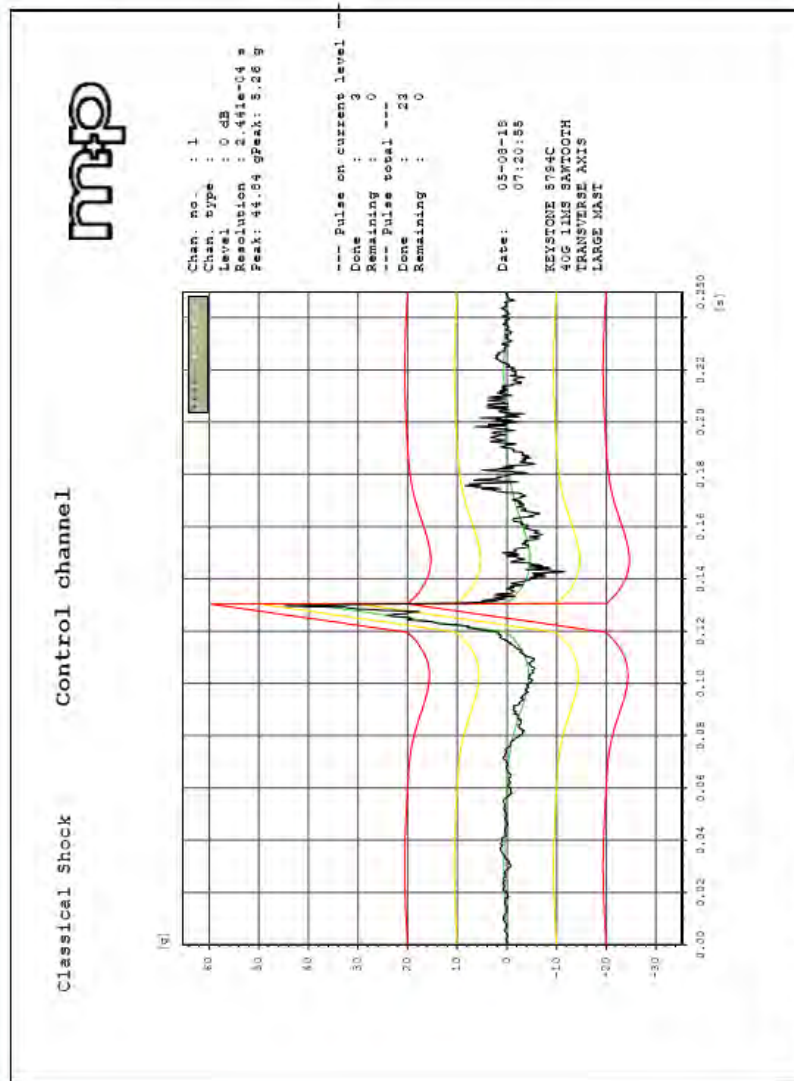


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Chart 5.2.1-20: EUT 2 Transverse Axis Positive Shock

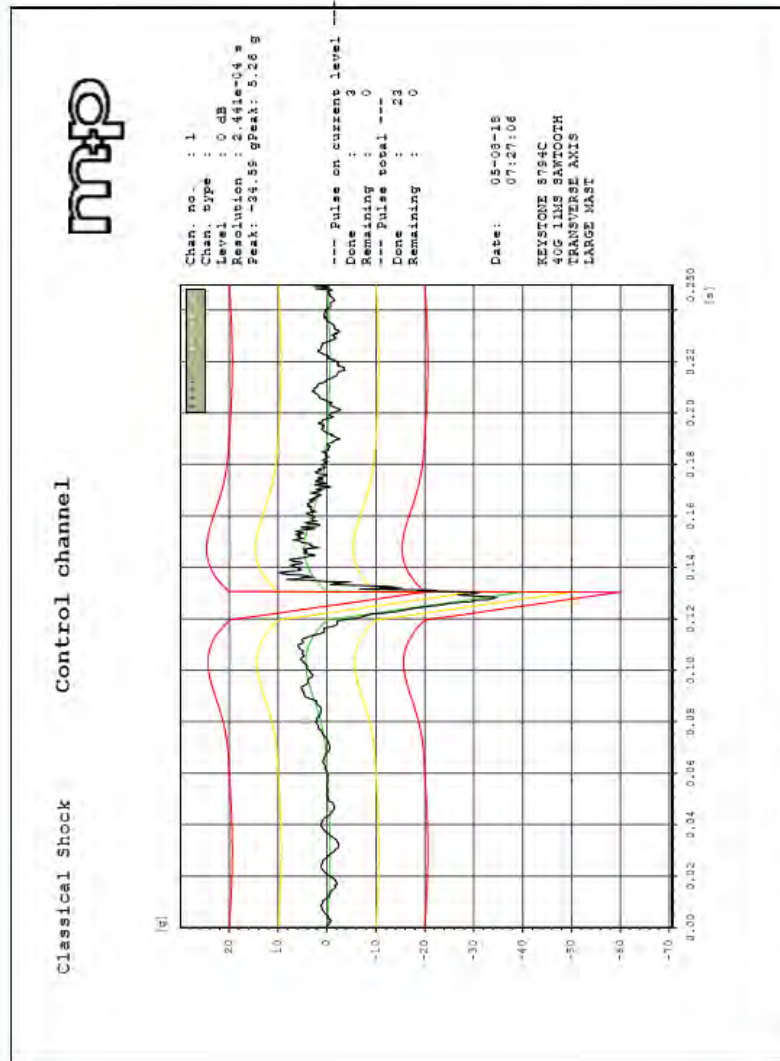


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Chart 5.2.1-21: EUT 2 Transverse Axis Negative Shock

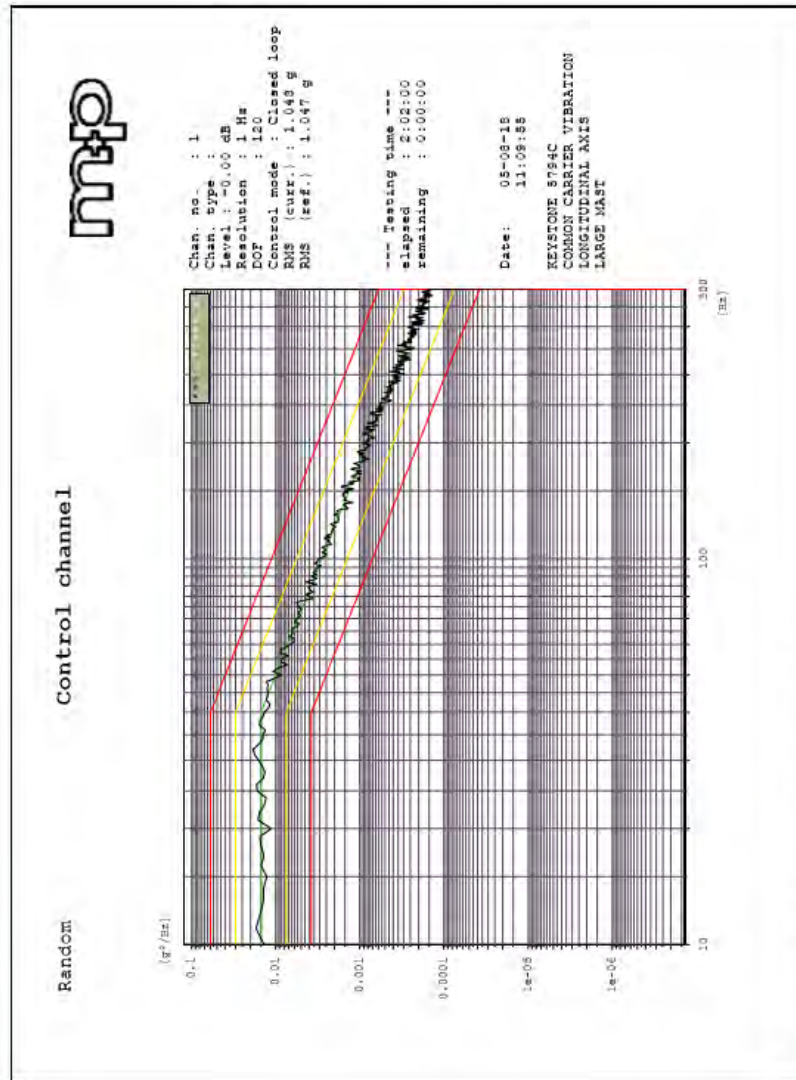


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Chart 5.2.1-22: EUT 2 Longitudinal Axis

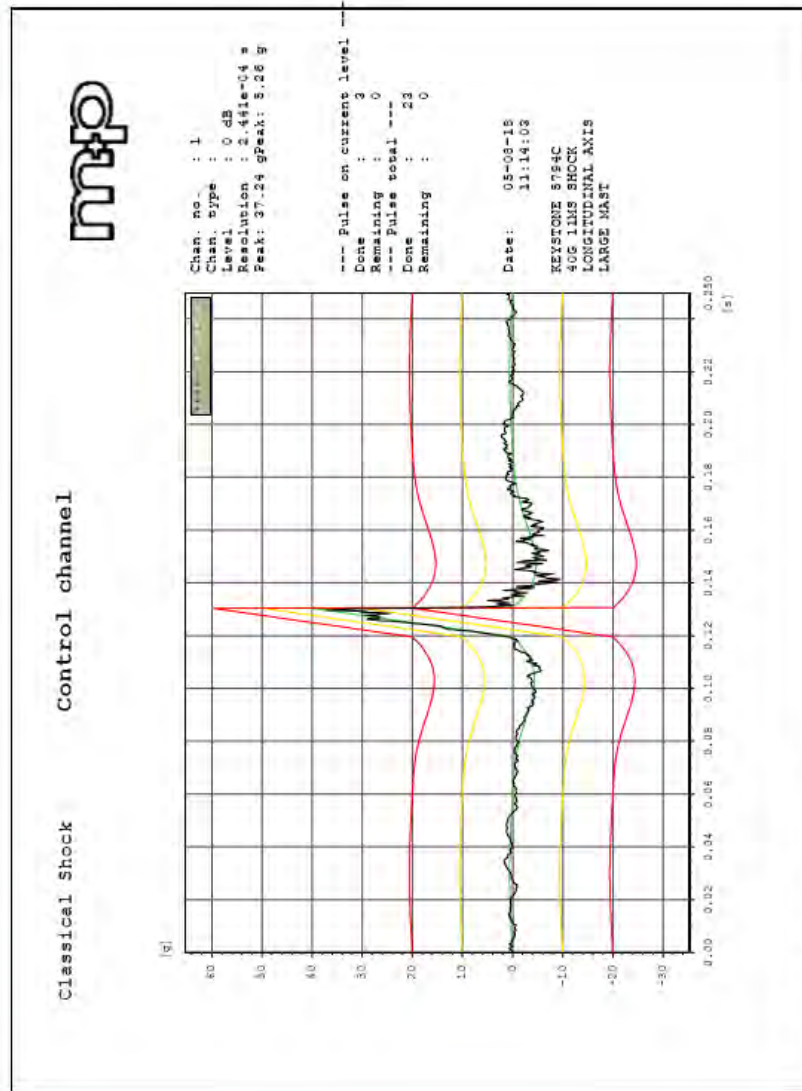


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Chart 5.2.1-23: EUT 2 Longitudinal Axis Positive Shock

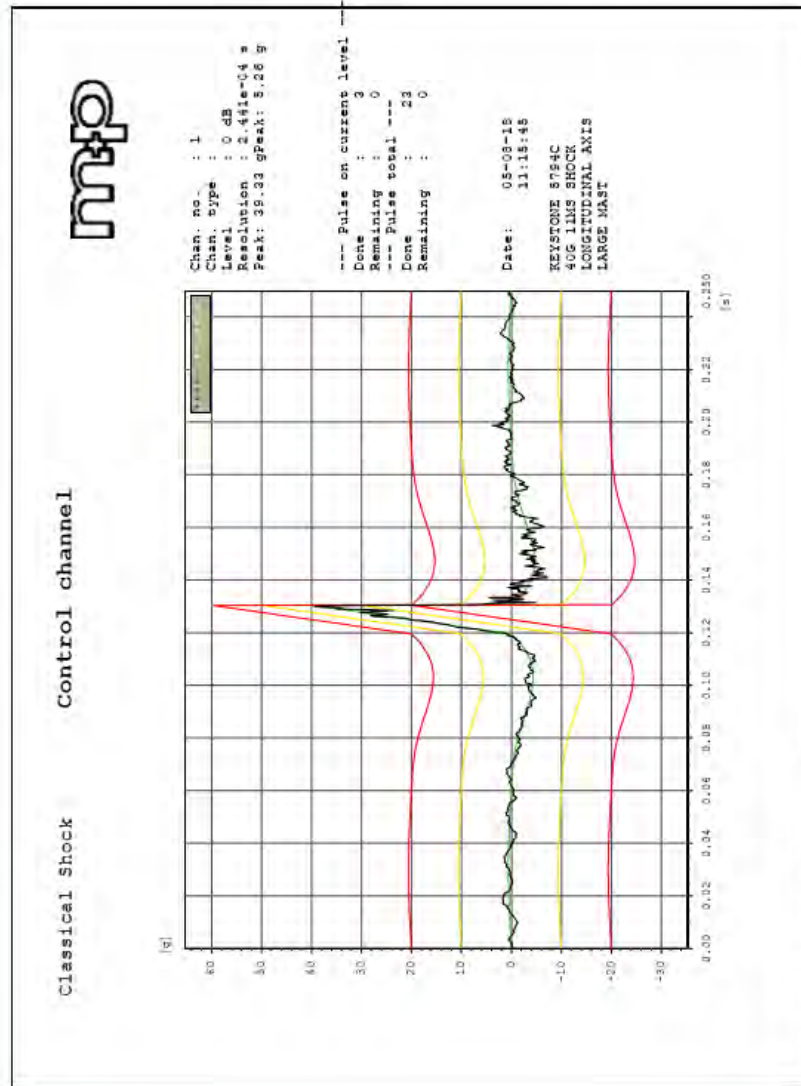


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Chart 5.2.1-24: EUT 2 Longitudinal Axis Negative Shock



C:\VspNT\Breen\lmp\40g 11ms SAWTOOTH.tcs

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5.2.2 Altitude

Parameters:

- A) 15,000 feet
- B) Ambient temperature
- C) One hour duration
- D) Storage and Operating configuration

Procedures:

- Step 1) All three units were placed in an altitude chamber in their operational configuration.
- Step 2) The chamber pressure was adjusted to simulated 15,000 feet.
- Step 3) This pressure was held for one hour.
- Step 4) The chamber pressure was adjusted to site ambient conditions.
- Step 5) All three units were placed in their storage configuration.
- Step 6) Steps 2-4 were repeated.

Results:

No damage was observed as a result of testing. All three units operated as intended after the test.

See Photos 5.2.2-1 thru 5.2.2-2 for test pictures

See Charts 5.2.2-3 thru 5.2.2-4 for test profiles

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Photo 5.2.2-1: Test Setup

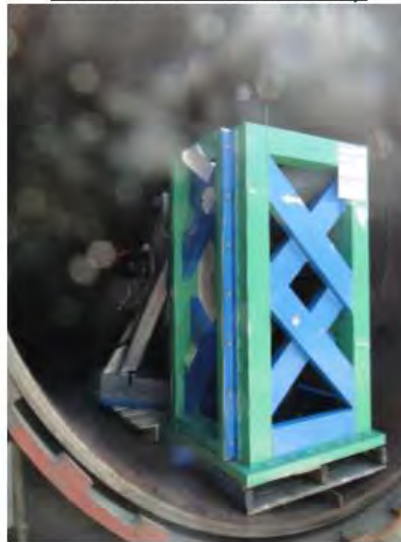


Photo 5.2.2-2: Test Setup

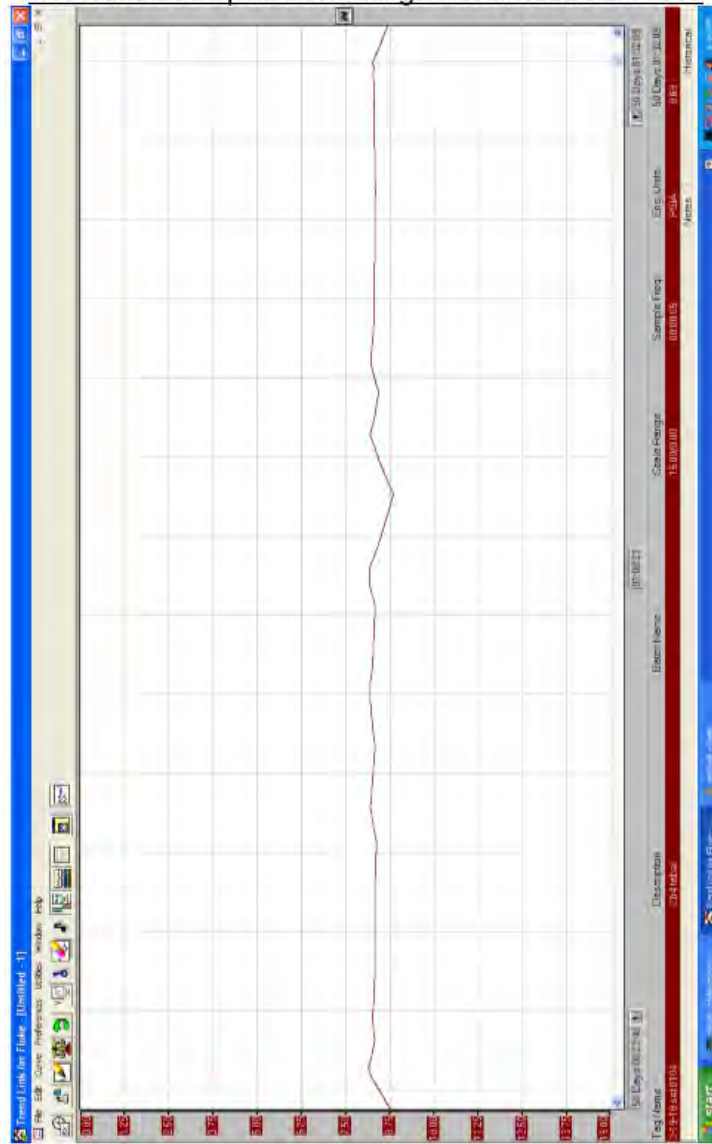


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Chart 5.2.2-3: Operation Configuration Pressure Profile

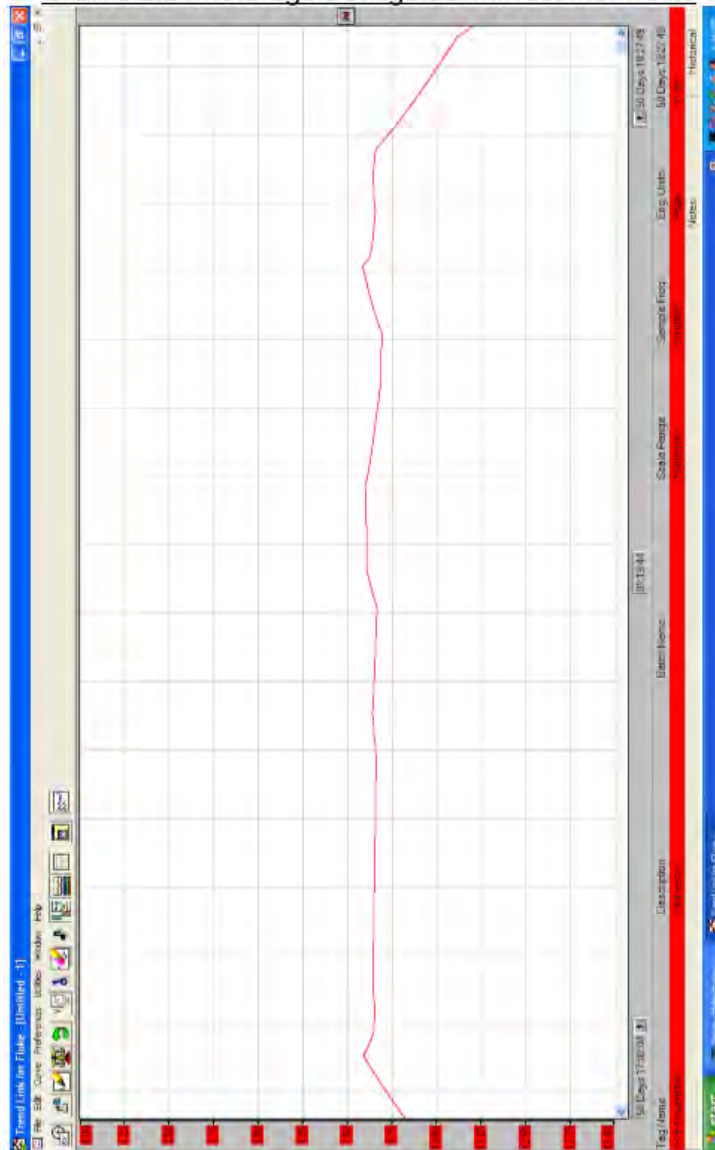


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Chart 5.2.2-4: Storage Configuration Pressure Profile



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5.2.3 Sand

Parameters:

- A) 60°C
- B) 2.2 g/m³ concentration
- C) 29 m/s air velocity
- D) 90 minutes per side on four sides
- E) All masts extended as much as chamber allowed

Procedures:

- Step 1) All units were placed in the chamber for Side #1.
- Step 2) The chamber temperature was adjusted to 60°C with 29 m/s air velocity and the sand feed was initiated to achieve 2.2 g/m³.
- Step 3) Side #1 was exposed to these conditions for 90 minutes.
- Step 4) Steps 1 – 3 were repeated until all four sides had been exposed.

Results:

The EUT showed no signs of damage as a result of testing and all units operated as intended afterward.

See Photos 5.2.3-1 thru 5.2.3-8 for test pictures

See Chart 5.2.3-9 for the test profile

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Photo 5.2.3-1: Side #1 EUT 2



Photo 5.2.3-2: Side #1 EUT 1



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Photo 5.2.3-3: Side #2 EUT 2



Photo 5.2.3-4: Side #2 EUT 1



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Photo 5.2.3-5: Side #3 EUT 2



Photo 5.2.3-6: Side #3 EUT 1



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Photo 5.2.3-7: Side #4 EUT 2



Photo 5.2.3-8: Side #4 EUT 1

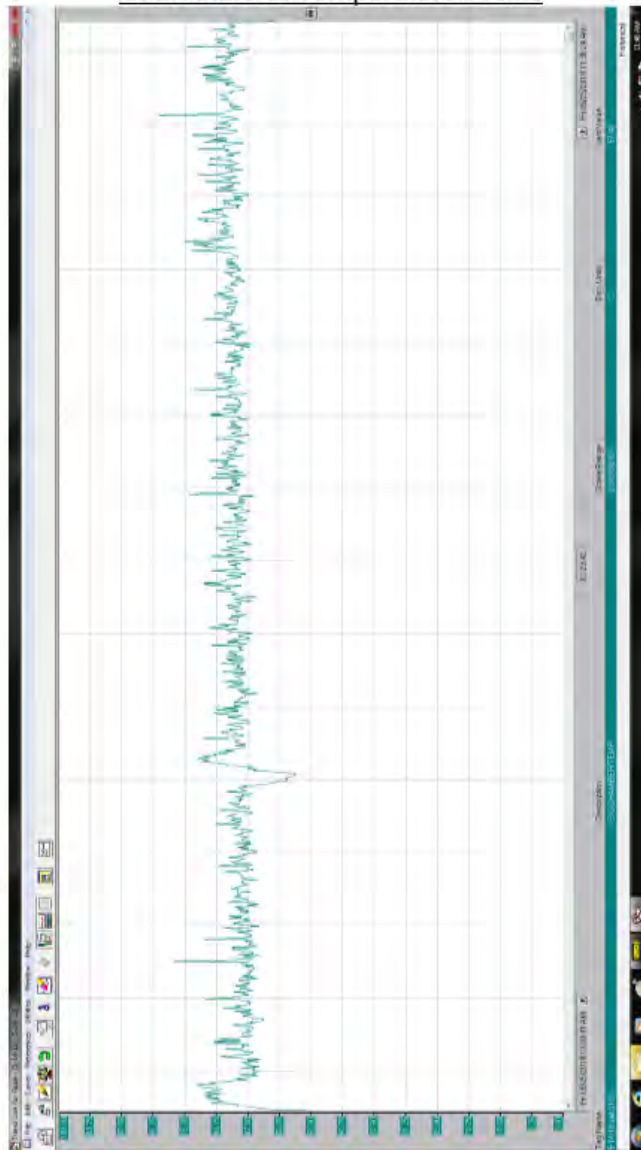


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Chart 5.2.3-9: Temperature Profile



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5.2.4 Dust

Parameters:

- A) Six hours
 - a. 1735 feet/minute air velocity
 - b. Ambient temperature
- B) Sixteen hours
 - a. 300 feet/minute air velocity
 - b. 60°C
- C) Six hours
 - a. 1735 feet/minute air velocity
 - b. 60°C
- D) 10.6g/m³ dust concentration
- E) <30% relative humidity
- F) Masts extended as much as chamber will allow

Procedures:

- Step 1) All three units were placed in the dust chamber.
- Step 2) The chamber air velocity was adjusted to 1735 feet/minute and the dust feed was initiated to achieve 10.6 g/m³.
- Step 3) These conditions were maintained for six hours.
- Step 4) The chamber air velocity was adjusted to 300 feet/minute and the temperature increased to 60°C.
- Step 5) These conditions were maintained for sixteen hours.
- Step 6) The chamber air velocity was adjusted to 1735 feet/minute.
- Step 7) These conditions were maintained for six hours.
- Step 8) The chamber conditions were returned to site ambient conditions.

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Results:

The EUT showed no signs of damage as a result of testing and operated as intended afterwards.

See Photos 5.2.4-1 thru 5.2.4-4 for test pictures

See Charts 5.2.4-5 thru 5.2.4-11 for test profiles

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Photo 5.2.4-1: Test Setup EUT #2



Photo 5.2.4-2: Test Setup EUT #1



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Photo 5.2.4-3: Post Test EUT #1



Photo 5.2.4-4: Post Test EUT #2

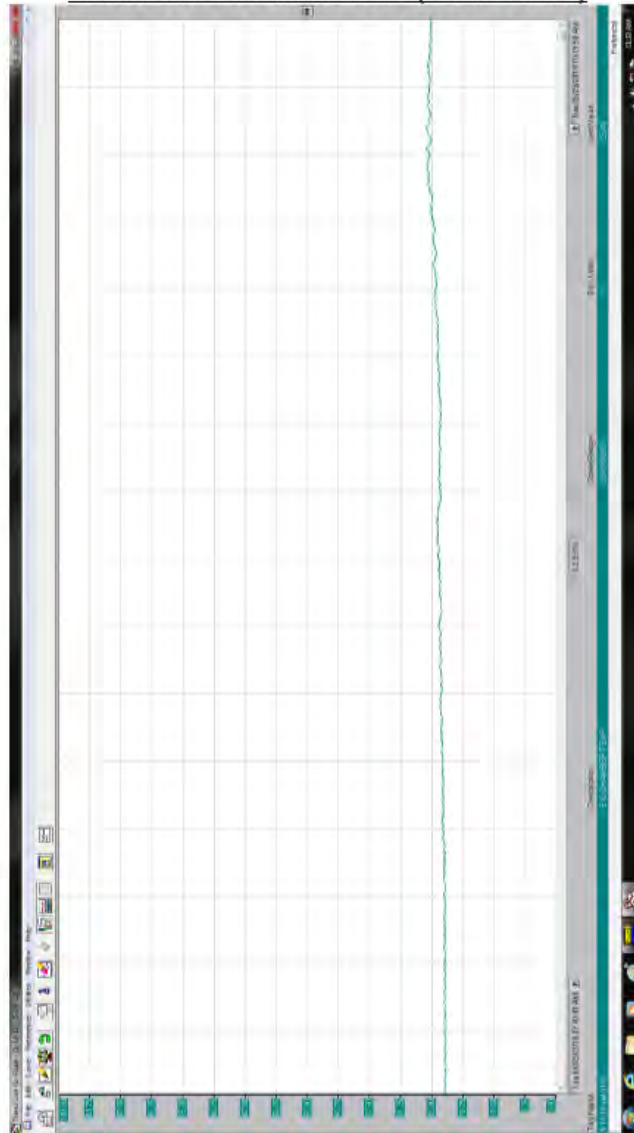


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Chart 5.2.4-5: Ambient Dust (First 2 hours)

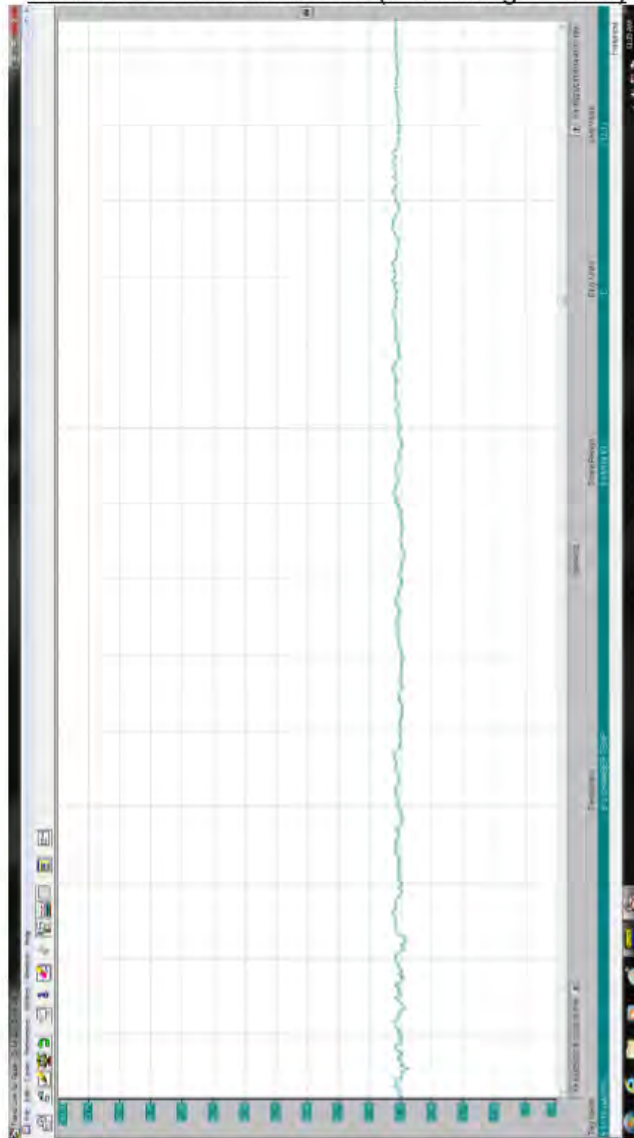


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Chart 5.2.4-6: Ambient Dust (Remaining 4 hours)



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Chart 5.2.4-7: High Temperature Low Wind Speed (First 5 hours)

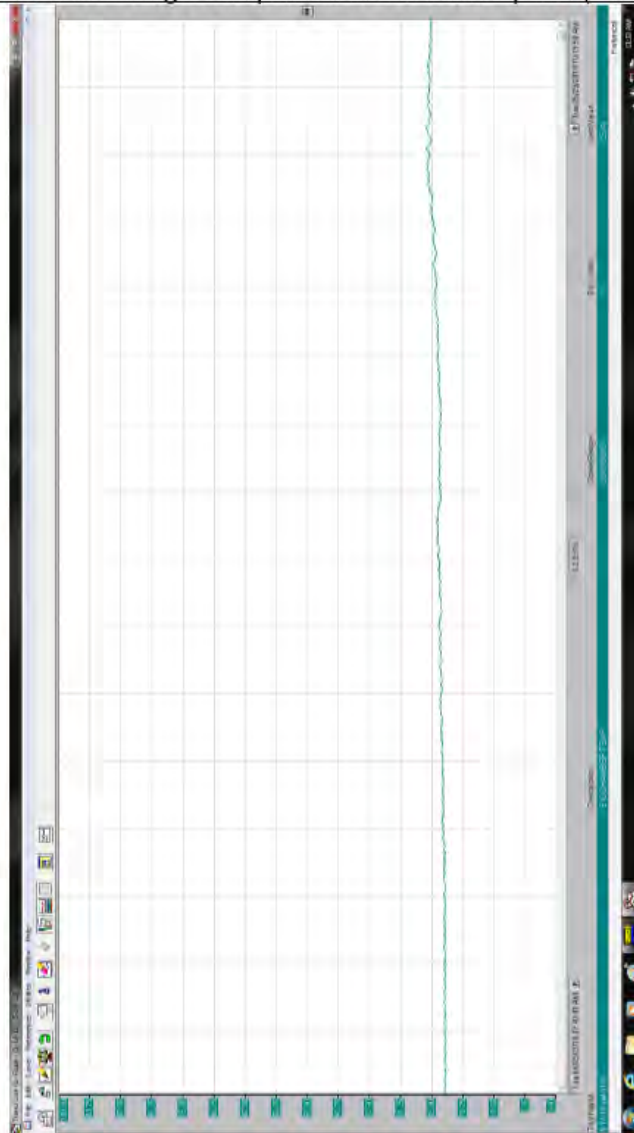


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Chart 5.2.4-8: High Temperature Low Wind Speed (9 hours)



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Chart 5.2.4-9: High Temperature Low Wind Speed (Remaining 2 hours)

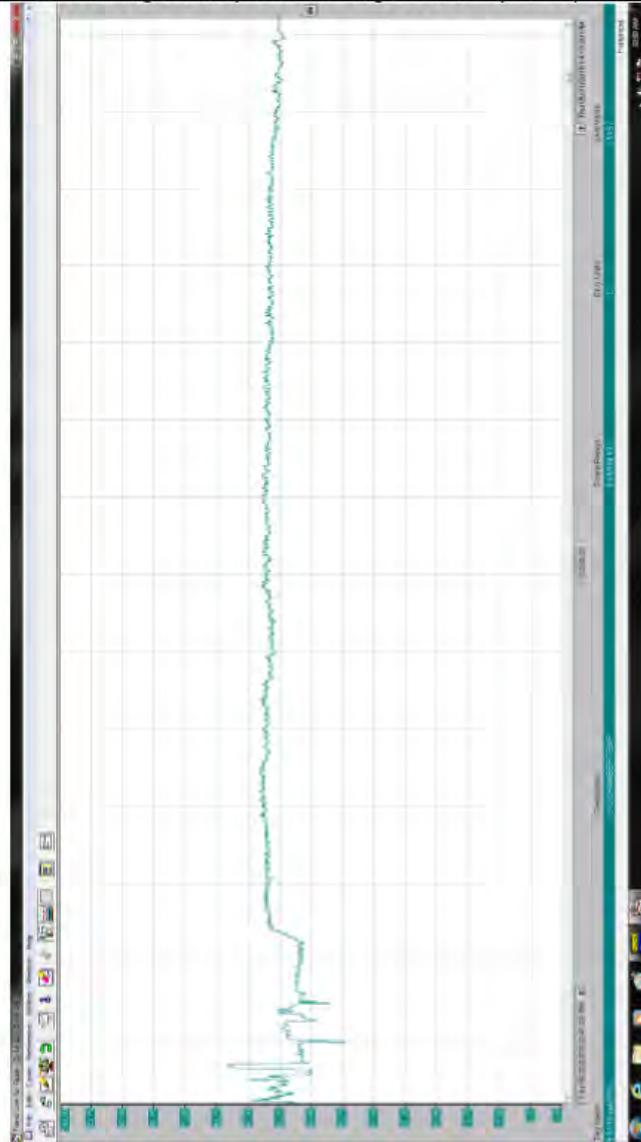


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Chart 5.2.4-10: High Temperature High Wind Speed (First 3 hours)

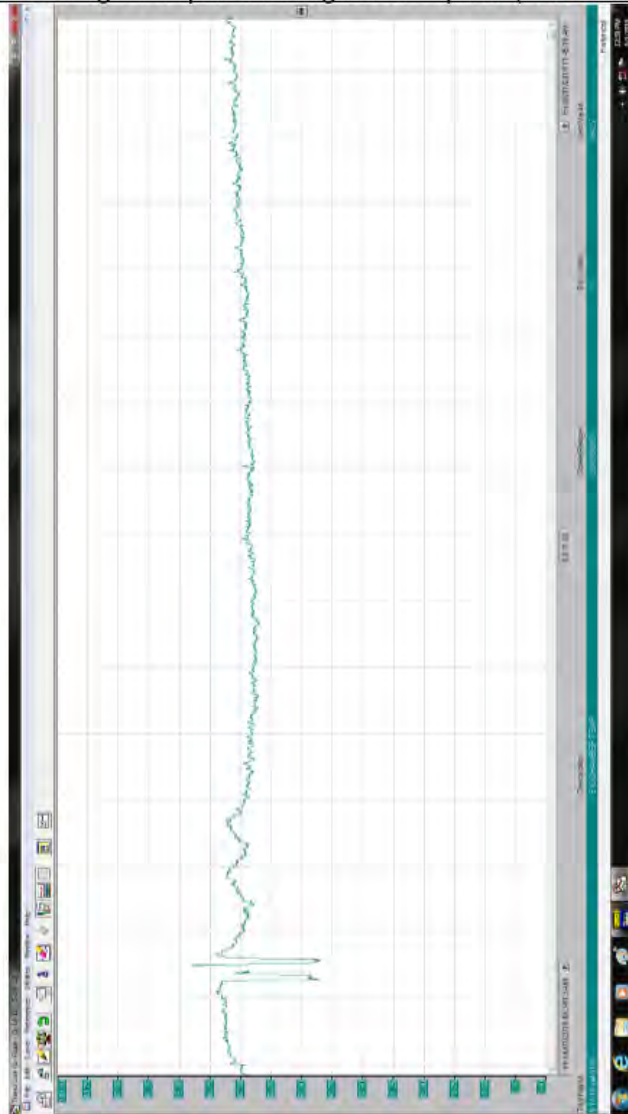


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Chart 5.2.4-11: High Temperature High Wind Speed (Remaining 3 hours)



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6. ACCEPTANCE CRITERIA

Acceptability will be contingent upon the ability of the EUT to perform its function before, during and after the test.

7. TEST RESULTS

See table ES-3 and section 5.2 for test results.

8. TEST MODIFICATIONS

None

9. TEST ITEM DISPOSITION

The EUT was returned to Keystone Compliance.

10. PERSONNEL

Will Nicholson
Zachary Miller

11. REPORT DISTRIBUTION

Keystone Compliance
131 Columbus Inner Belt
New Castle, PA 16101
Attention: Jackie Haggerty Email: jackie@keystonecompliance.com

A. E-LABS Job Number 5794-C

END OF REPORT