NTS Silicon Valley
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Newark, CA 94560

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Environmental Test Report

For

Mechatronics Inc.

Axial Fans

Testing Per: IEC 60529

COMPANY: Mechatronics Inc.
8152 304th Avenue SE
Issaquah, WA 98027

TEST SITE(S): National Technical Systems
38995 Cherry Street
Newark, CA 94560

JOB NUMBER: PR078912

REPORT DATE: August 7, 2018

TOTAL PAGES: 23

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REVISIONS

Revision	Reason for Revision	Date
0	Original	August 7, 2018

TABLE OF CONTENTS

1.0 SUMMARY

Six (6) Mechatronics Inc. Axial Fans were subjected to IP68 testing per IEC 60529. IP6X was performed at NTS Fullerton and IPX8 at NTS Newark. No visual or functional anomalies were noted as a result of testing. Post-test visual inspections and functional were conducted by NTS engineering. The EUT passed the Water Ingress and Dust tests per the pass/fail criteria.

Equipment under Test (EUT) Description:

EUT	Size
MS6038	60x60x38mm
MS8038	80x80x38mm
MS9225	92x92x25mm
MS1238	120x120x38mm
MS1751	172x150x51mm
LPH12A99	120X120X38.5mm

Figure 1: MS1751

Figure 2: MS1238

Figure 3: MS6038

Figure 4: MS9225

Figure 5: MS8038

Figure 6: LPH12A99

2.0 GENERAL TESTING INFORMATION

2.1 References

a. IEC 60529
b. Customer PO#: 7575

2.2 Test Equipment

The instruments used during testing covered by this report are presented in the equipment list in APPENDIX C.

2.3. Instrumentation Calibration Policy

National Technical Systems adheres to a standard calibration cycle. Each category "A" instrument undergoes recalibration every 12 months, while other instruments are recalibrated on a periodic basis. All calibration is traceable to the National Institute of Standards and Technology (NIST).

2.4 Test Conditions/Profiles

The tests were conducted at conditions specified in IEC 60529

2.5 Pass Fail Criteria

IP6X

The protection is satisfactory if, on inspection, talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment or impair safety. Except for special cases to be clearly specified in the relevant product standard, no dust shall deposit where it could lead to tracking along the creepage distances.

IPX8

After testing in accordance with the appropriate requirements of 14.2.1 to 14.2.8 the enclosure shall be inspected for ingress of water.

It is the responsibility of the relevant technical committee to specify the amount of water which may be allowed to enter the enclosure and the details of a dielectric strength test, if any.

In general, if any water has entered, it shall not:

– be sufficient to interfere with the correct operation of the equipment or impair safety;
– deposit on insulation parts where it could lead to tracking along the creepage distances;
– reach live parts or windings not designed to operate when wet;
– accumulate near the cable end or enter the cable if any.

If the enclosure is provided with drain-holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.

For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.

3.0 DISPOSITION OF TEST SAMPLE

Upon conclusion of testing, the EUT was returned to Mechatronics Inc..

APPENDIX A

TEST DATA

RECEIVING INSPECTION FORM

CUSTOMER:	Mechatronics Inc.	**MJO:**	PR078912
TEST ITEM:	Axial Fans: MS1751H24B-FSR-2EM, MS1238H24B-FSR-2EM, MS6020H24B-RSR-2EM, MS9225H24B-FSR-2EM, MS8038H24B-FSR-2EM, LPH12A99 BTHR AC100-240	**DATE:**	5/17/2018
		UNIT NO:	6 samples
		TECH/ENGR:	RC

ITEM OR S/N	CONDITION / INSPECTION	TECH:
MS1751H24B-FSR-2EM	No visual defects noted.	RC
MS1238H24B-FSR-2EM	No visual defects noted.	RC
MS6020H24B-RSR-2EM	No visual defects noted.	RC
MS9225H24B-FSR-2EM	No visual defects noted.	RC
MS8038H24B-FSR-2EM	No visual defects noted.	RC
LPH12A99BTHR AC100-240	No visual defects noted.	RC

Other:

Pictures:

SVE 11.0 Rev 0

IMMERSION DATA LOG SHEET

CUSTOMER:	Mechatronics Inc.	**MJO:**	PR078912
TEST ITEM:	Axial Fans	**DATE:**	5/18/18
MODEL NO.	See Receiving form	**UNIT**	See Below (NTS#)
SPECIFICATION:	IEC 60529 IPX-8	**TECH / ENGR:**	RC

DESCRIPTION OF TEST

DATE:	TIME:	LOG ENTRY:	TECH/ENGR INITIALS:
5/18/18	14:30	6 axial fans were submerged into a water tank at a depth of 2 meter for a 30 min. duration.	RC
5/18/18	15:00	Pulled from tank. Testing completed.	RC
		NTS#FRE5919, FRE6071, FRE6073, FRE6074, FRE6075, FRE6076	
Note: NTS verified power up and fan operation of each test specimen upon completion of immersoin testing.			RC

TECHNICIAN / ENGINEER: Ray Chavez **DATE:** 5/21/18
PICS: X

PLN 21.MIL.12 Rev.0 Page 1 of 1

APPENDIX B

PHOTOGRAPHS

Figure 7: Immersion Tank

Figure 8: Test Setup

APPENDIX C

EQUIPMENT LIST*

	IMMERSION EQUIPMENT LIST TEMPLATE					
MJO/JO#:	PR078912				05/18/18	
If Used	**NTS ID#**	**Manufacturer**	**Description**	**Model No.**	**Cal Date**	**Cal Due**
Yes	2923	Chem Tainer	Water Tank	TC46761C	N/A	
Yes	2978	Thomas Scientific	Stopwatch	1235C26	7/3/2017	7/3/2018
Yes	3371	Stanley	Tape Measure	STH30824	NPCR	
Yes	3150	BK Precision	Power Supply	1901	N/A.	
Yes	387	Fluke	Digital Volt meter	87	02/08/18	02/08/19

N/A: Not Applicable

* The instrumentation used in the performance of these tests is periodically calibrated and standardized within the manufacturer's rated accuracies. The calibration procedures and practices are in accordance with ANSI/NCSL Z540.3-2006 and ISO 17025. Certification of calibration is on file subject to inspection by request.

APPENDIX D

IP6X Dust (Category 2)

Data Package
Project Number PR078912-00
NTS Silicon Valley (Mechatronics Inc.)

IP6X Dust (Category 2) Test

6/1/18

GENERAL DATA SHEET

CUSTOMER:	NTS Silicon Valley (Mechatronics Inc.)	**PR NO.:**	PR078912-00
TEST:	IP6X Dust (Category 2)	**START DATE:**	6/1/2018
TEST ITEM:	Fans	**END DATE:**	6/1/2018
PART NUMBER:	See Below	**SERIAL NO.:**	NTS-1 to NTS-6
SPECIFICATION:	IEC 60529 **REV.** ed 2.2	**PARA:**	13.4
TECHNICIAN:	Steve Crisp	**TEMP:** 78°F	**RH:** 47%
PROG. MANAGER:	Marty McCormick	**DEVIATION:**	☑ NO ☐ YES

DATE	TIME	TEST DESCRIPTION
6/1/2018	10:10	The test unit is placed into the dust chamber non operating.
	10:10	The dust is maintained in a suspension using a short burst of air (GN-2) for
		approximately 1 minute every hour and then allowed to settle on the test unit.
	18:11	Test End
		Return samples to NTS Silicon Valley for post test analysis
		Fans Tested:
		PN: MS1751H24B-FSR-2EM SN: NTS-1
		PN: LPH12A99BTHR AC100-240 SN: NTS-2
		PN: MS1238H24B-FSR-2EM SN: NTS-3
		PN: MS9225H24B-FSR-2EM SN: NTS-4
		PN: MS8038H24B-FSR-2EM SN: NTS-5
		PN: MS6020H24B-RSR-2EM SN: NTS-6

FUL 21.29.1, Rev. 8

Page 1 of 1

IP6X Dust (Category 2) Equipment List

Client: NTS Silicon Valley (Mechatronics Inc.) **PR No.:** PR078912-00 **Start Date:** 6/1/2018 **End Date:** 6/1/2018

Control No.	Equipment	Manufacturer	Model No.	Serial No.	Accuracy	Range	Calibration	
							Cycle	Cal. Due
FL0732	Chamber (Dust, Settling)	National Technical Systems	NTS-64	001	MFG	Ambient	No Calibration Required	N/A
FL7502	Meter (Hygrometer)	Cole-Parmer	03313-86	122608217	± 2° F/ 4% RH	32 to 122 °F/ 35 to 95% RH	24 Months	3/7/2019

FUL 21.29.1, REV. 7

Test Item Identification

Test Item Identification

Test Item Identification

Test Item Identification

Test Item Identification

Test Item Identification

Dust Chamber Setup

Post Test

End of Report