
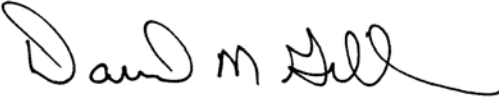


## Engineering Report 40881-1

### Dust Test

for

**Mechatronics, Inc.**  
**8152 - 304th Avenue S.E.**  
**Preston, WA 98050**

<b>Prepared By:</b>	 Nora R. Somers, Technical Writer
<b>Approved By:</b>	 David M. Gillen, Vice President
<i>This document shall not be reproduced except in full, without the written authorization of Environ Laboratories LLC.</i>	

## Revision History

Revision	Total Number of Pages	Date	Description
--	10	October 27, 2009	Original

<b>Prepared for:</b>  Mechatronics, Inc. 8152 - 304th Avenue S.E. Preston, WA 98050  Attention: Mr. Shawn Psachos	<b>Test Dates</b>	
	<b>Start:</b>	10/6/2009
	<b>Completion:</b>	10/6/2009
	<b>Environ Test Number:</b>	<b>40881-1</b>
	<b>Purchase Order Number:</b>	<b>4772</b>
	<b>Purchase Date:</b>	9/8/2009

## Dust Test

### 1.0 Abstract

#### 1.1 Object

Subject four Fans to a Dust Test as specified in *IEC 60529*, Paragraph 13.4, Category 2, IP5X, as requested in Mechatronics, Inc. purchase order 4772, dated September 8, 2009.

#### 1.2 Conclusions

Upon completion of the exposure there was no visible damage to any of the test units. All fans operated after the exposure with no significant change in current draw. Actual current readings are listed in Section 4.3 of this report and are recorded on Figure 1, the test data sheet.

### 2.0 Unit(s) Tested

**Table 1: Units Tested**

<b>Manufacturer</b>	Mechatronics, Inc.
<b>Device</b>	Four (4) Fans
<b>Model/Part Number</b>	F6025E12B, F8025H12B, G9225X12B, G1238L12B
<b>Serial Number</b>	N/A

*The results of this test apply only to the units identified in this Engineering Report by device identifier and model / part number, or serial number.*

### 3.0 Test Requested

Subject four Fans to a Dust Test as specified in *IEC 60529*, Paragraph 13.4, Category 2, IP5X.

#### **Dust test for first characteristic numeral 5**

The test is made using a dust chamber whereby the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50  $\mu\text{m}$  and the nominal width of a gap between wires 75  $\mu\text{m}$ . The amount of talcum powder to be used is 2 kg per cubic meter of the test chamber volume. It shall not have been used for more than 20 tests.

Category 2: Enclosures where no pressure difference relative to the surrounding air is present.

#### **Category 2 enclosures**

The enclosure under test is supported in its normal operating position inside the test chamber but is not connected to a vacuum pump. Any drain hole normally open shall be left open for the duration of the test. The test shall be continued for a period of 8 hours.

#### **Acceptance Criteria**

The protection is satisfactory if talcum powder has not accumulated in a quantity or location such that 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.

## 4.0 Instrumentation, Procedure, and Results

### 4.1 Instrumentation

All instrumentation is calibrated regularly by instruments directly traceable to the National Institute of Standards and Technology, and in accordance with *MIL-I-45208A*, *ANSI/NCSL Z540.3-2006*, and *ISO/IEC 17025: 2005*.

**Table 2: Instrumentation List**

<b>Equipment Number</b>	<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Last Calibration</b>	<b>Due Calibration</b>	<b>Range</b>
210-055	Digital Multimeter	Fluke	87 IV	10/24/2008	10/24/2009	0 to 20 Amps
380-557	DC Power Supply	Sorensen	DCS 60-18E	11/24/2008	11/24/2009	0 to 60 Vdc; 0 to 18A
504-038	Dust Chamber	TRW	D-6	N/A	N/A	1 cubic meter

## 4.2 Procedure

The test units were placed inside the dust chamber. Talcum powder that met the requirements of *IEC 60529* was used for the test. The amount of talcum powder used was 2 kilograms per cubic meter of test chamber volume. The chamber was sealed. The dust activation system was initiated and the test was started. The duration of the exposure was 8 hours. After completion of the exposure, the test units were removed from the dust chamber. The fans were energized at 12 Vdc.

## 4.3 Results

Upon completion of the exposure there was no visible damage to any of the test units. All fans operated after the exposure. Actual current readings are listed below and are recorded on Figure 1, the test data sheet. The test units were returned to Mechatronics, Inc.

**Table 3: Pre, and post-test current draw**

Model	Pre-test current	Post-test current
F6025E12B	141 mA	136 mA
F8025H12B	129 mA	122 mA
G9225X12B	474 mA	417 mA
G1238L12B	230 mA	218 mA

Figure 1, herein, is the test data sheet. Photograph 1 shows the test setup. Photograph 2 shows the test units post-test. Photographs 3 through 5 show test unit identification.



DATA SHEET

Page (s)	1 of 1		
Test Date (s)	10/6/09		
Job Number	40881-1		
DCAS	<input type="checkbox"/>	Anomaly / Interruption	<input type="checkbox"/>
Witness	<input type="checkbox"/>	Nonconformity / Deviation	<input type="checkbox"/>
Certified Witness	<input type="checkbox"/>	Customer Present	<input type="checkbox"/>
Specification Approved by Client (initial): _____			

COMPANY: *Mechatronics*  
DEVICE: *Fans*  
MODEL NO.: *See Below*  
SERIAL NO.: *N/A*

TEST DESCRIPTION: *Dwt*      SPEC: *IEC 60529*      SECTION: *IPSX*  
*Category 2*

Equipment List					
<i>270-055</i>	<i>380-557</i>	<i>504-038</i>			

Conditions / Summary

*Models F 6025 E 12 B*  
*F 8025 H 12 B*  
*G 9225 X 12 B*  
*G 1238 L 12 B*

<i>Operational Clock @ 12vdc</i>	<i>Pre Test Current</i>	<i>Post Test Current</i>
<i>F 6025 E 12 B</i>	<i>141mA</i>	<i>136mA</i>
<i>F 8025 H 12 B</i>	<i>129mA</i>	<i>122mA</i>
<i>G 9225 X 12 B</i>	<i>474mA</i>	<i>417mA</i>
<i>G 1238 L 12 B</i>	<i>230mA</i>	<i>218mA</i>

*2 Kg of telc in chamber*  
*No vacuum*  
*duration is 8 hours*

*Started 9:15 AM - 10/6/09*  
*Stopped 4:20 PM - 10/6/09*

*No visible damage*  
*All units operated after the test*

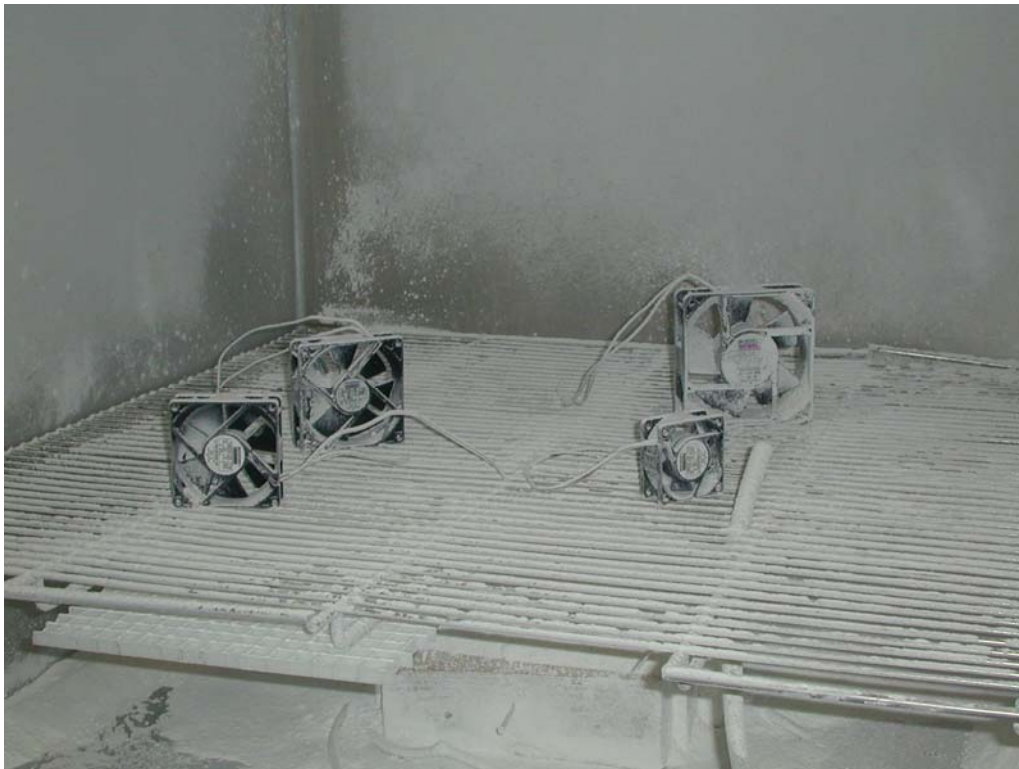
Disposition:  Retained at Environ  Returned to Client  Other

Test Performed By: \_\_\_\_\_

Figure 1: Dust Test Data Sheet



Photograph 1: Test setup



Photograph 2: Test units post-test





Photograph 3: Test unit identification



Photograph 4: Test unit identification



Photograph 5: Test unit identification