

Test Report Number 40748-06.CPC

Testing of
Amazon Case and Amazon Rack

PREPARED FOR: CP Cases
Unit 11 Worton Hall Ind Est
Worton Road
Isleworth
Middlesex United Kingdom TW7 6-EE


PREPARED BY: National Technical Systems
36 Gilbert Street South
Tinton Falls, NJ 07701


ISSUED: 07/07/07

REVISION PAGE

Rev. #	Date	Page #	Para. #	Description
0	07/07/07			Complete Document

SIGNATURES

Prepared By: 
Mark Betts, Senior Engineer

Reviewed By: 
Mark Betts, Program Manager

Approved By: 
Richard C. Gaynor, Facility Manager

TABLE OF CONTENTS

1.0	PURPOSE	6
1.1	Test Program Sequence	6
1.1.1.	Receipt Inspection.....	6
1.1.2.	Functional Test.....	6
1.1.3.	Environmental Testing.....	6
2.0	APPLICABLE DOCUMENTS	7
2.1	CP Cases PO Number 217863	7
2.2	Mil-Std-810F	Error! Bookmark not defined.
2.3	NTS Corporate Quality Policy Manual	7
3.0	TEST ITEMS	7
3.1	Description	7
3.2	Security Classification of Items	7
4.0	TEST DATE(S) AND EQUIPMENT	7
4.1	Test Date(s)	7
4.2	Test Equipment	7
5.0	GENERAL TEST REQUIREMENTS	8
5.1	Test Facility	8
5.2	Test Sample Configuration	8
6.0	TEST DESCRIPTIONS AND RESULTS	8
6.1	Test Summary	8
7.0	TEST PROCEDURE	9
7.1	Solar Radiation:	9
7.1.1.	Requirements	9
7.1.2.	Test Procedure	9
7.1.3.	Comments	9
7.2	High Temperature Basic Hot:	11
7.2.1.	Requirements	11
7.2.2.	Test Procedure	11
7.2.3.	Comments	11
7.3	Low Temperature Basic Cold:	13
7.3.1.	Requirements	13
7.3.2.	Test Procedure	13
7.3.3.	Comments	13
7.4	Blowing Rain:	14
7.4.1.	Requirements	14
7.4.2.	Test Procedure	14
7.4.3.	Comments	14
7.5	Blowing Sand:	15
7.5.1.	Requirements	15
7.5.2.	Test Procedure	15
7.5.3.	Comments	15
7.6	Fungus:	16
7.6.1.	Requirements	16

7.6.2.	Test Procedure	16
7.6.3.	Comments	16
7.7	Transit Drop:	17
7.7.1.	Requirements	17
7.7.2.	Test Procedure	17
7.7.3.	Comments	17
Appendix A,	Test Equipment List	18
Appendix B,	Solar Radiation Data	20
Appendix C,	High Temperature Data	22
Appendix D,	Low Temperature Data	24
Appendix E,	Blowing Rain Data	26
Appendix F,	Blowing Sand Data	28
Appendix G,	Fungus Data	30
Appendix H,	Transit Drop Data.....	34
Appendix I,	Photographs	36

1.0 PURPOSE

This test report describes the methods used for the Environmental Testing of the Amazon Case and Amazon Rack, tested for CP Cases This test program was conducted to determine the ability of the Amazon Case and Amazon Rack to successfully satisfy the requirements specified in the references listed in section 2.0 of this report.

1.1 Test Program Sequence

The Amazon Case and Amazon Rack were subjected to Environmental qualification testing as follows:

1.1.1. Receipt Inspection

Upon receipt at NTS, the Amazon Case and Amazon Rack were visually inspected to ensure there had been no damage due to shipping/handling, and to confirm that the test model number and serial number coincide with those on the packing list. No discrepancies or damage were observed.

1.1.2. Functional Test

The Amazon Case and Amazon Rack were visually inspected after the tests for physical damage

1.1.3. Environmental Testing

Environmental Testing was performed in accordance with Purchase Order 217863. The test methods were:

Test	Methods
Solar Radiation	Mil-Std-810F Method 505.3 Procedure I
High Temperature Basic Hot	Mil-Std-810F Method 501.4
Low Temperature Basic Cold	Mil-Std-810F Method 502.4 Procedure I
Blowing Rain	Mil-Std-810F Method 506.4 Procedure I
Blowing Sand	Mil-Std-810F Method 510.4 Procedure II
Fungus	Mil-Std-810F Method 508.5
Transit Drop	Mil-Std-810F Method 516, Procedure IV

2.0 APPLICABLE DOCUMENTS

2.1 CP Cases PO Number 217863

2.2 Mil-Std-810F

2.3 NTS Corporate Quality Policy Manual
Revision 1, Dated January 15, 2002.

3.0 TEST ITEMS

3.1 Description

Qty.	Item	P/N
1	Amazon Case	AC 50450
1	Amazon Rack	AR 064805

3.2 Security Classification of Items

Unclassified

4.0 TEST DATE(S) AND EQUIPMENT

4.1 Test Date(s)

Test	Date(s)
Solar Radiation	08/07-10/06
High Temperature Basic Hot	06/29/06-07/05/06
Low Temperature Basic Cold	07/08-11/06
Blowing Rain	07/12/06
Blowing Sand	06/27/06
Fungus	07/07/06-08/04/06
Transit Drop	06/06/06

4.2 Test Equipment

A list of the test equipment used is included in Appendix A of this report. This equipment is calibrated according to ISO 10012-1 and calibration is traceable to the National Institute of Standards and Technology (NIST). Calibration records are maintained on file at National Technical Systems.

5.0 GENERAL TEST REQUIREMENTS

5.1 Test Facility

The Amazon Case and Amazon Rack were tested at the test facilities in Tinton Falls, NJ

5.2 Test Sample Configuration

The test item configurations are documented in the photographs contained in this test report.

6.0 TEST DESCRIPTIONS AND RESULTS

- The Amazon Case and Amazon Rack were inspected upon receipt for damage, no damage was noted.
- All tests were performed in accordance with Section 2.0 of this test report.

6.1 Test Summary

The Amazon Case and Amazon Rack met the requirements of Section 2.0 of this test report. Reference the appropriate section for test procedure and results.

Test	Reference
Solar Radiation	Mil-Std-810F Method 505.3 Procedure I
High Temperature Basic Hot	Mil-Std-810F Method 501.4
Low Temperature Basic Cold	Mil-Std-810F Method 502.4 Procedure I
Blowing Rain	Mil-Std-810F Method 506.4 Procedure I
Blowing Sand	Mil-Std-810F Method 510.4 Procedure II
Fungus	Mil-Std-810F Method 508.5
Transit Drop	Mil-Std-810F Method 516, Procedure IV

7.0 TEST PROCEDURE

7.1 Solar Radiation:

7.1.1 Requirements

The Amazon Case and Amazon Rack shall be tested for solar radiation using Mil-Std-810F, Method 505.3 Procedure I Temperature Category A1 at 1120 w/m² with a maximum temperature of + 49°C

7.1.2 Test Procedure

- The temperature chamber was stabilized at 35°C.
- 1120 w/m² of light was applied inside the temperature chamber.
- The Amazon Case and Amazon Rack were ramped from 35°C to 49°C and back to 35°C in 24 hours as shown in figure 505.4-1 Category A1 below, with constant light exposure.
- The Amazon Case and Amazon Rack were tested for 3- 24 hour cycles.
- At the end of the last cycle the Amazon Case and Amazon Rack were returned to standard ambient conditions and stabilized.

7.1.3 Comments

The Amazon Case and Amazon Rack complied with the Solar Radiation test. Please reference Appendix B for test data.

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

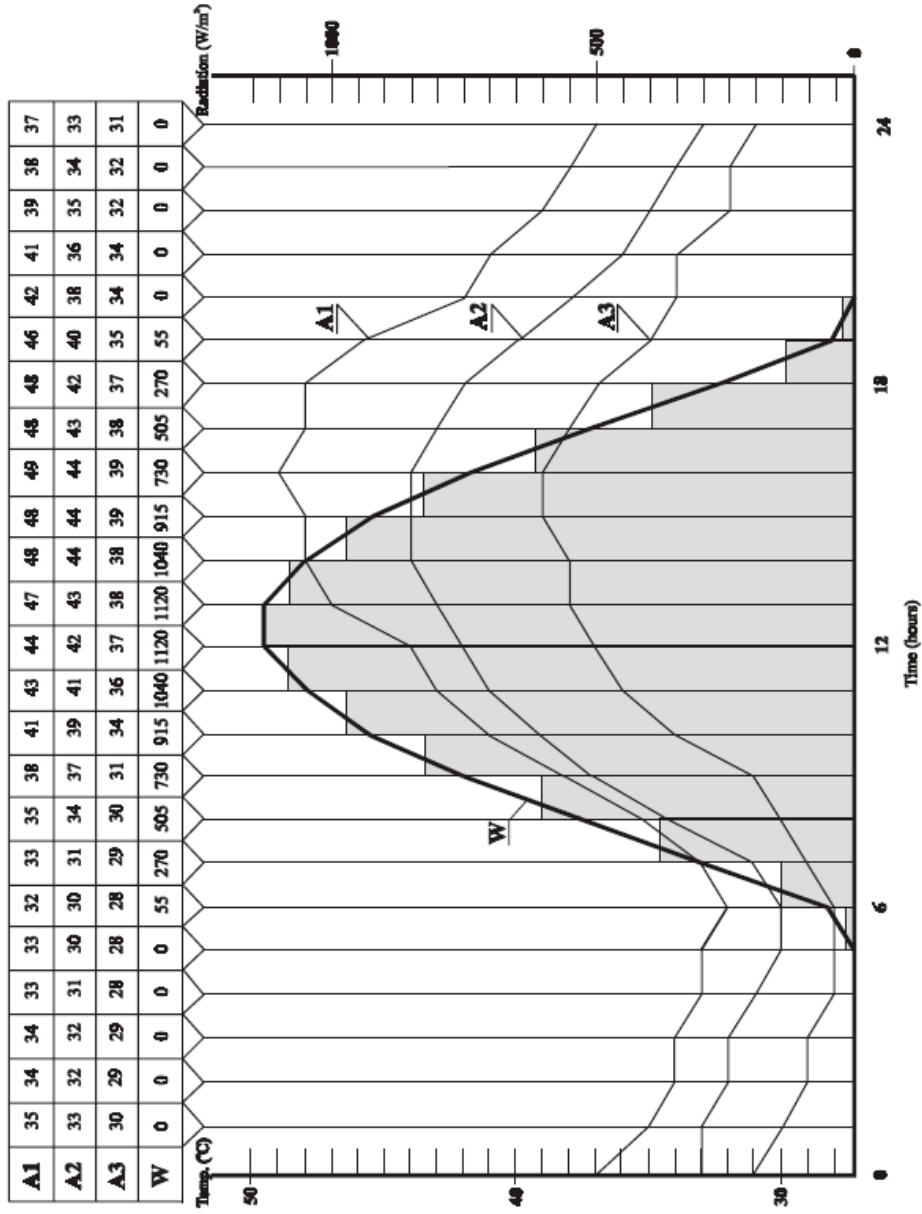


FIGURE 505.4-1. Procedure 1 - Cycling Test.

7.2 High Temperature Basic Hot:

7.2.1. Requirements

The Amazon Case and Amazon Rack shall be tested for high temperature using Mil-Std-810F, Method 501.4 at 63°C.

7.2.2. Test Procedure

- The chamber internal temperature was raised to 33° C.
- The Amazon Case and Amazon Rack were tested per the profile in Figure 501.4-I Basic Hot Conditions below.
- The Amazon Case and Amazon Rack were tested for 7- 24 hour cycles.
- At the end of the last cycle the Amazon Case and Amazon Rack were returned to standard ambient conditions and stabilized.

7.2.3. Comments

The Amazon Case and Amazon Rack complied with the High Temperature test. Please reference Appendix C for test data.

TABLE 501.4-I. High temperature cycles, climatic category - Basic Hot.¹

Time of Day	Ambient Air Conditions		Induced Conditions	
	Temperature ² °C (°F)	Humidity ³ % RH	Temperature ² °C (°F)	Humidity ³ % RH
0100	33 (91)	36	33 (91)	36
0200	32 (90)	38	32 (90)	38
0300	32 (90)	41	32 (90)	41
0400	31 (88)	44	31 (88)	44
0500	30 (86)	44	30 (86)	44
0600	30 (86)	44	31 (88)	43
0700	31 (88)	41	34 (93)	32
0800	34 (93)	34	38 (101)	30
0900	37 (99)	29	42 (107)	23
1000	39 (102)	24	45 (113)	17
1100	41 (106)	21	51 (124)	14
1200	42 (107)	18	57 (134)	8
1300	43 (109)	16	61 (142)	6
1400	43 (110)	15	63 (145)	6
1500	43 (110)	14	63 (145)	5
1600	43 (110)	14	62 (144)	6
1700	43 (109)	14	60 (140)	6
1800	42 (107)	15	57 (134)	6
1900	40 (104)	17	50 (122)	10
2000	38 (100)	20	44 (111)	14
2100	36 (97)	22	38 (101)	19
2200	35 (95)	25	35 (95)	25
2300	34 (93)	28	34 (93)	28
2400	33 (91)	33	33 (91)	33

¹ These cycles were obtained from AR 70-38, 1 August 1979, and essentially conform to those in MIL-HDBK-310 and NATO STANAG 2895. These values represent typical conditions throughout a typical day in this climatic category. "Induced Conditions" are air temperature levels to which materiel may be exposed during storage or transit situations that are aggravated by solar loading.

² Humidity control during high temperature testing is generally not necessary. Use these values only in special cases.

³ Data were originally recorded in °F and converted to °C. Hence, table data conversion may not be consistent.

7.3 Low Temperature Basic Cold:

7.3.1. Requirements

The Amazon Case and Amazon Rack shall be tested for low temperature using Mil-Std-810F, Method 502.4 Procedure I at a temperature of -51°C

7.3.2. Test Procedure

- The chamber was stabilized at ambient.
- The Amazon Case and Amazon Rack were ramped from ambient to -51°C and stabilized.
- The Amazon Case and Amazon Rack were tested for 3- 24 hour cycles.
- At the end of the last cycle the Amazon Case and Amazon Rack were returned to standard ambient conditions and stabilized.

7.3.3. Comments

The Amazon Case and Amazon Rack complied with the Low Temperature Test. Please reference Appendix D for test data.

7.4 Blowing Rain:

7.4.1. Requirements

.The Amazon Case and Amazon Rack shall be tested for blowing rain using Mil-Std-810F, Method 506.4 Procedure I at a rate of 4 inches per hour at 40 mph.

7.4.2. Test Procedure

The Amazon Case and Amazon Rack were placed in their normal positions.

The Amazon Case and Amazon Rack were exposed to the rain test at a rate of 4 inches per hour at 40 mph. After the initiation of the rain, the wind source was turned on and adjusted to produce a horizontal wind velocity of 40 miles per hour (3,500 feet per minute).

7.4.3. Comments

The Amazon Case and Amazon Rack complied with the Blowing Rain Test. Please reference Appendix E for test data.

7.5 Blowing Sand:

7.5.1. Requirements

.The Amazon Case and Amazon Rack shall be tested for blowing sand using Mil-Std-810F, Method 510.4 Procedure II at a rate of .033 +/- .0075 grams per cubic foot at 29 m/s.

7.5.2. Test Procedure

- The chamber controls were set to maintain an internal chamber temperature of 49° C. The air velocity was adjusted to 29 m/s. The sand feeder was adjusted to control the sand concentration at .033 +/- .0075 grams per cubic foot. These conditions were maintained for 6 hours each. 4 faces of the units were exposed for 90 minutes each.
- All chamber controls were turned off and the Amazon Case and Amazon Rack were allowed to return to standard ambient conditions. Accumulated Sand was removed from the Amazon Case and Amazon Rack by brushing, wiping, or shaking.

7.5.3. Comments

The Amazon Case and Amazon Rack complied with the Blowing Sand Test. Please reference Appendix F for test data.

7.6 Fungus:

7.6.1. Requirements

.The Amazon Case and Amazon Rack shall be tested for fungus using Mil-Std-810F, Method 508.5. The test duration of 28 days was used A representative case lid from the Amazon Case only was tested due to size constraints.

7.6.2. Test Procedure

- The Amazon Case Lid was prepared in accordance with section 508.5
- A complete visual examination of the Amazon Case Lid was conducted with special attention to discolored areas, imperfections, or the existence of any other conditions that could be conducive to fungus growth.
- The results were recorded for compliance.

7.6.3. Comments

The Amazon Case and Amazon Rack complied (0 Rating) with the Fungus Test Please reference Appendix G for test data.

7.7 Transit Drop:

7.7.1. Requirements

.The Amazon Case and Amazon Rack shall be tested for transit drop using Mil-Std-810F, Method 516.5 Procedure IV at a height of 48”.

7.7.2. Test Procedure

- The Amazon Case and Amazon Rack were dropped from a height of 48” for 26 drops and then inspected for damage.

7.7.3. Comments

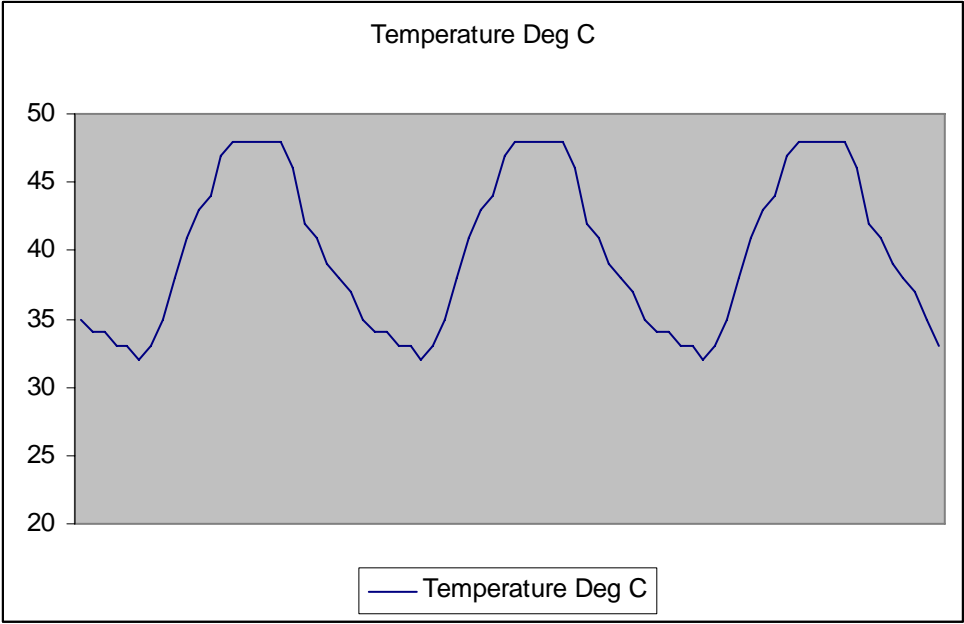
The Amazon Case and Amazon Rack complied with the Transit Drop Test. Please reference Appendix H for test data.

Appendix A, Test Equipment List

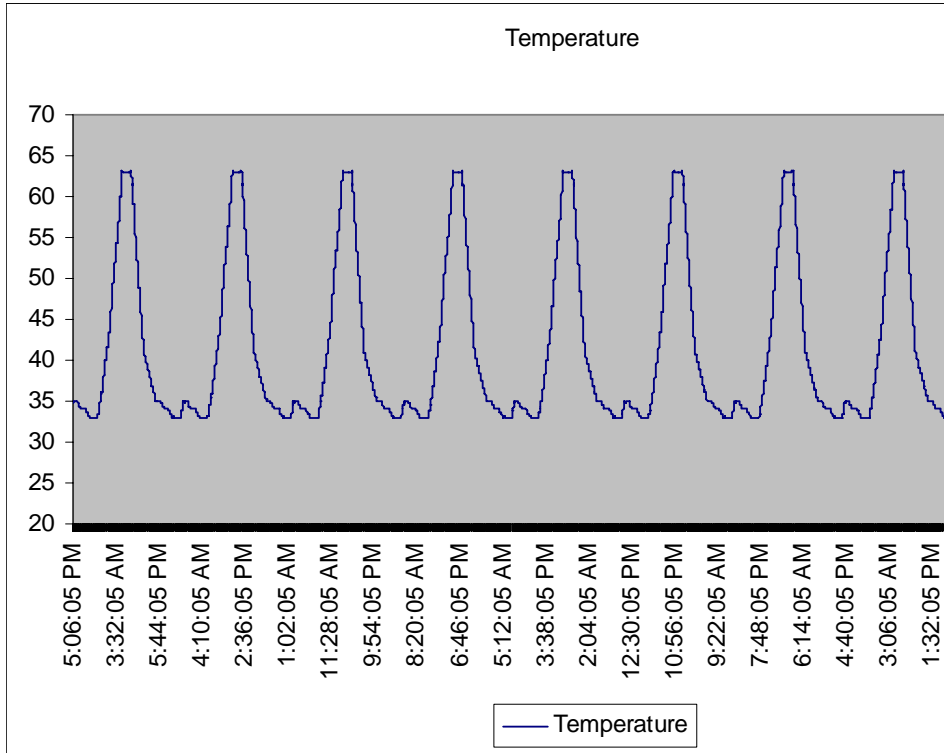
Test Equipment Used

NTS #	Manufacturer	Make	Model	S/N	Cal. Date	Cal. Due
CH424	Thermotron	Thermal Chamber	WP-499-TCM2-10-10	23-9618	NCR	NCR
NJ0211	NTS	Sand Chamber	N/A	1	NCR	NCR
NJ0206	Extech	Mini Vane CFM Thermo Anemometer	407117	Z063445	3/8/2005	3/8/2007
NJ0209	Vaisala	Measurement Indicator	MI70	Y402003 8	NCR	NCR
NJ0207	Vaisala	RH&T Probe	HMP76	Y461000 4	05/10/05	05/10/07

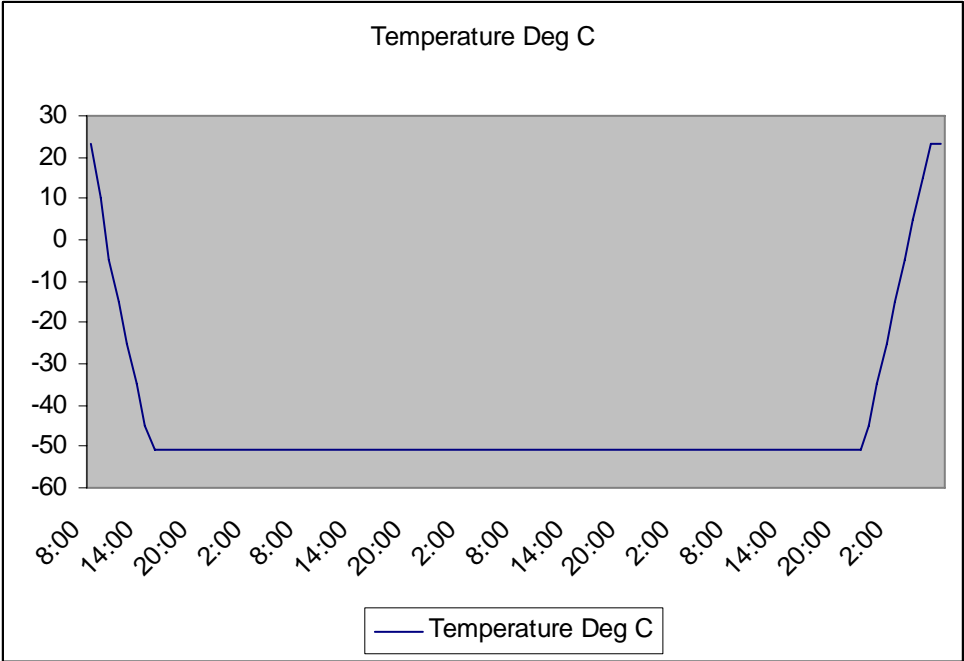
Appendix B, Solar Radiation Data



Appendix C, High Temperature Data



Appendix D, Low Temperature Data



Appendix E, Blowing Rain Data

DATA SHEET

Job Number: 40748-06	Date: 7/12/06	Page 1 of 1
Client: CP Cases	P. O. No.: 217863	
Test: Blowing Rain	Test Item: Amazon Case] Amazon Rack	
Specification: Mil-Std-810	Model or P/N: AC 50450 AR 064805	
Para./Sect.: 506.4 Procedure I	S/N(s): N/A	

Remarks: Tested for 1 hour on each side

Side Tested	Rate (" /hr)	Wind Velocity (MPH)				
1	4	40				
2	4	40				
3	4	40				
4	4	40				

Test Performed By: Mark Betts

Project Manager: Mark Betts

Appendix F, Blowing Sand Data

Appendix G, Fungus Data



REPORT

14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7006
(714) 730-6239 - FAX (714) 730-8462
www.truesdail.com

National Technical Systems
Attn: Mark Betts
533 Main St
Acton, MA 01720

Report Date: 8/10/06
Date Received: 6/27/06
Laboratory No. 956188

Sample: One case lid

Investigation: Fungus Resistance Testing (MIL-STD-810F, 506.5)

RESULTS

Fourteen day cultures of the following pure culture fungi were harvested, washed and their spore counts adjusted to 1,000,000 ($\pm 200,000$ per ml).

<u>Organism</u>	<u>ATCC Number</u>
Aspergillus niger	6275
Aspergillus terreus	106990
Paecilomyces variotii	18502
Penicillium ochro-chloron	9112
Scopulariopsis brevicaulis	36840
Trichoderma viride	9645
Aspergillus niger	9642
Aspergillus flavus	9643
Aspergillus versicolor	11730
Penicillium funiculosum	11797
Chaetomium globosum	6205

The samples were rinsed with warm tap followed by a deionized water rinse three days before testing. The samples were placed in the chamber and preconditioned for four hours. The spore suspensions were combined and sprayed on the sample and controls which were placed in the test chamber. The sample and controls were incubated for twenty eight days and examined. The results are as follows:

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from these laboratories.



TRUESDAIL LABORATORIES, INC.

Report Continued
National Technical Systems
Laboratory No. 956188
8/10/06
Page 2

Sample Designation	Observations (Rating*)			
	7 Days	14 Days	21 Days	28 Days
Case Lid, Exterior	0	0	0	0
Case Lid, Interior	0	0	0	0
Controls:				
Cotton	4	4	4	4
Filter Paper	4	4	4	4
Potato Dextrose Agar	4	4	4	4
Glass Slides	0	0	0	0

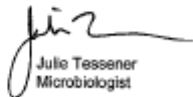
* Rating: 0=no growth, 1=traces, 2=light, 3=moderate, 4=heavy growth
** One side/other side

Conclusion

The sample did not allow any fungus growth (Rating of 0).

Respectfully submitted,

TRUESDAIL LABORATORIES, INC.


Julie Tessener
Microbiologist



This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from these laboratories.

TRUESDAIL LABORATORIES, INC.

LABORATORY No. 956188 DATE RECEIVED 6/27/06
 CLIENT: NTS NJ DATE REPORTED 8/7/06
 SAMPLE 1 Case Lid

METHODS USED MIL-STD 810F
 DATA & CALCULATIONS: Cultures 6/14/06, harvest & wash 7/3/06 Test 7/1/06

Sample	Observations			
	7	14	21	28 days
Outside	0	0	0	0
Inside	0	0	0	0

Controls

Filter Paper	4
Cotton	4
PDA	4
Glass Slides	0

SUMMARY OF RESULTS:

DATE	Total Time
	Hrs.
Signed <u>JT</u>	

Appendix H, Transit Drop Data



TEST PROFILE

TR- 40748-06

Customer Name:	0
Test Name:	Drop (Shock)
Specification:	MIL-Std-810F
Spec. Date	
Para. / Method:	Method 516 Proc IV

Unit(s) Under Test:	Amazon Case/Amazon Rack
Quantity:	1 each
P/N(s):	AC 504540/AR 064805
S/N(s):	N/A

UUT Weight	Case 25 kg/Rack 45 kg
Drop Height	122 cm (48")
Packaged/Unpackaged	Unpackaged
Total # of Drops	26
Response Accel. 1 Location	N/A
Response Accel. 2 Location	N/A
Response Accel. 3 Location	N/A

TEST SETUP AND RESULTS

Test Started:	6/6/2006
---------------	----------

Test Completed:	6/6/2006
-----------------	----------

Sequence #	Orientation
1	S1
2	S2
3	S3
4	S4
5	S5
6	S6
7	C1
8	C2
9	C3
10	C4
11	C5
12	C6
13	C7

Sequence #	Orientation
14	C8
15	E1
16	E2
17	E3
18	E4
19	E5
20	E6
21	E7
22	E8
23	E9
24	E10
25	E11
26	E12

Unit Under Test Information	Y	N	N/A	Comments
Tested in shipping container:		X		
Operating during test:			X	
Operated by Client:			X	
Powered during testing:			X	
Passes post-test functionals:			X	
Physical damage noted:		X		Scratches only
Does unit(s) pass requirements:	X			

COMMENTS: Units are shipping containers

Test Technician:	Mark Betts
------------------	------------

Appendix I, Photographs

Blowing Rain



Solar Radiation/Temperature



Sand



Transit Drop

