

Requester:	Orangebox US Inc. 3445 East Paris Ave SE Grand Rapids, MI 49512
Contact Name / Number:	Russ Whitaker (616) 285-2545 x10
Dates Tested:	07/20/15 to 07/28/15
Date Submitted:	07/30/15
Technician:	Ron Day
Customer Request I.D.	N/A

**Scope:** To evaluate the AD-33DC, manufactured by Orangebox US Inc., by subjecting it to the following tests:

**Requested Tests:**

<u>Test Name</u>	<u>Requirement</u>
Backrest Strength Test – Horizontal – Static	ANSI/BIFMA X5.4-2012, Section 5
Backrest Durability Test – Horizontal – Cyclic	ANSI/BIFMA X5.4-2012, Section 7
Unit Drop Test - Dynamic	ANSI/BIFMA X5.4-2012, Section 17
Stability Tests	ANSI/BIFMA X5.4-2012, Section 21

**Product Description:**

<u>Specimen</u>	<u>Description</u>	<u>Supplier</u>
1	AD-33DC - 120° Seat, Internal Back & Screen	Orangebox US Inc.

**Summary:**

<u>Test Name</u>	<u>Results</u>
Backrest Strength Test – Horizontal – Static	Passed
Backrest Durability Test – Horizontal – Cyclic	Passed
Unit Drop Test - Dynamic	Passed
Stability Tests	Passed

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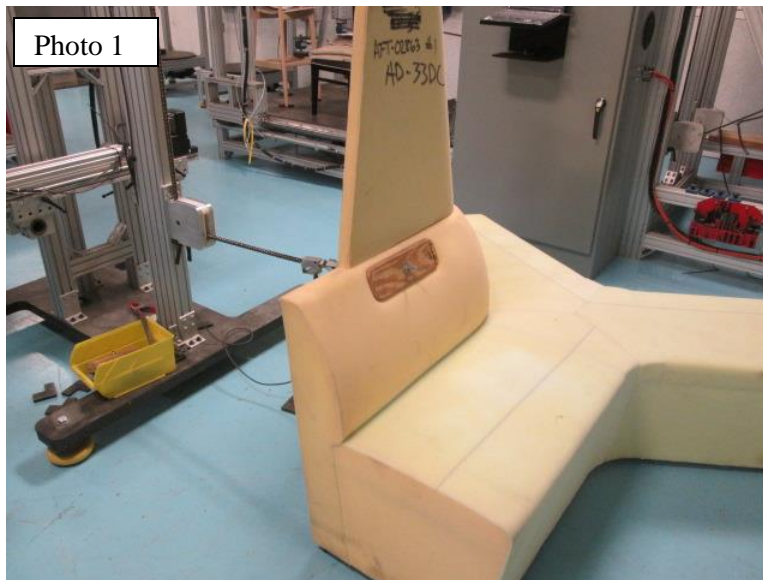
## Test Results:

### 1. Backrest Strength Test – Horizontal – Static:

Testing was performed per ANSI/BIFMA X5.4-2012, Section 5.

#### Notes:

- Temperature / humidity 74° F / 56 RH%.
- Load applied 16" up from the seat at the side to side center of each seating position on the backrest.
- See Photo 1 for setup.



<u>Specimen</u>	<u>Load</u> <u>(lbs.)</u>	<u>Time</u> <u>(sec.)</u>	<u>Observations</u>
1	150 x 2	60	No loss of serviceability.
	250 x 2	60	No sudden and major change in structural integrity.

#### **Requirement:**

Functional Load: A functional load applied once shall cause no loss of serviceability to the unit.

Proof Load: A proof load applied once shall cause no sudden and major change in the structural integrity of the unit. Loss of serviceability is acceptable.

Equipment:	Test machine (TM-029), CMD (TD-046), Tape measure (TD-094), Digital protractor (TD-059), Stopwatch (TD-010)
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## 2. Backrest Durability Test – Horizontal – Cyclic:

Testing was performed per ANSI/BIFMA X5.4-2012, Section 7.

### Notes:

- Temperature / humidity 73 - 76° F / 53 - 58 RH%.
- Load applied 16" up from the seat at the side to side center of each seating position.
- Test rate: 26 cpm.
- See Photo 2 for setup.



<u>Specimen</u>	<u>Cycles</u>	<u>Observations</u>
1	0	Test begun - Position 1.
	120,000	No loss of serviceability.
	120,000	Test resumed - Position 2.
	240,000	No loss of serviceability.

**Requirement:** *There shall be no loss of serviceability.*

Equipment:	Test machine (TM-029.2), CMD (TD-046), Tape measure (TD-094), Digital protractor (TD-059), Stopwatch (TD-010).
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### 3. Unit Drop Test – Dynamic:

Testing was performed per ANSI/BIFMA X5.4-2012, Section 17.

#### Notes:

- Temperature / humidity 74° F / 55 RH%.
- Unit weight: 130 lbs.
- Each end of the unit was raised 4.7" and allowed to free-fall to the floor.
- See Photo 3 for setup.



<u>Specimen</u>	<u>End</u>	<u>Observations</u>
1	Left Side	No loss of serviceability.
	Right Side	No loss of serviceability.

#### **Requirement:**

*There shall be no loss of serviceability.*

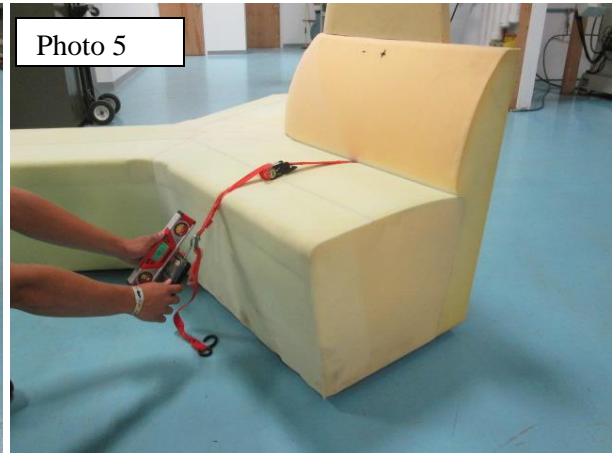
Equipment:	Tape measure (TD-094), Scale (TD-008)
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#### 4. Stability Tests:

Testing was performed per ANSI/BIFMA X5.4-2012, Section 21.

##### Notes:

- Temperature / humidity 74° F / 55 RH%.
- Unit weight: 130 lbs.
- Front stability load applied at a 45° downward angle at the front edge of the seat surface.
- Minimum rear stability force calculation:  $1.1(47-18) = 31.9$  lbs.
- Minimum front stability force calculation:  $130 \times .40 = 52$  lbs.
- See Photo 4 for rear stability setup, and photo 5 for front stability setup.



<u>Specimen</u>	<u>Stability</u>	<u>Force</u>	<u>Observations</u>
1	Rear	83.0 lbs.	The unit did not tip over.
	Front	52.1 lbs.	The unit did not tip over.

##### ***Requirement:***

Rear Stability: *Application of the force shall not cause the unit to tip over.*

Front Stability: *The force shall not be less than 40% of the total unit weight.*

Equipment:	Digital Level (TD-073), Tape measure (TD-094), Scale (TD-008), Force Gage (TD-007)
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