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Booho Chair One Co., Ltd.
Date: May 10, 2013
P. O. No.: BH20120926

Report No.:100917074GRR-001D
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Test Report For:
Booho Chair One Co., Ltd.
ANSI/BIFMA X5.1-2011
CHAIR TEST STANDARD
J1 G100 CHAIR


Lynwood Pearson
Project Manager


Bryan Stratton
Reviewer

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DATE RECEIVED: 10/1/2012
DATES TESTED: 10/2/2012 – 5/6/2013

DESCRIPTION OF SAMPLES:

Part Description: J1 G100 CHAIR
Condition of Test Sample: New

WORK REQUESTED/APPLICABLE DOCUMENTS:

To test the submitted sample per ANSI/BIFMA X5.1-2011 Chair Test Standard for the following test program:

| <u>Test No.</u> | <u>Test Description</u> |
|-----------------|------------------------------|
| 5 | Back Rest Strength-Tilt |
| 7 | Base |
| 8 | Drop-Dynamic |
| 9 | Swivel Cycle |
| 10 | Tilt Mechanism |
| 11 | Seating Durability |
| 12 | Stability |
| 14 | Arm Strength-Horizontal |
| 15 | Backrest Durability-Tilt |
| 17 | Caster/Chair Base Durability |
| 21 | Arm Durability |

CONCLUSION:

The submitted sample meets the acceptance criteria of the tests listed above.

TEST EQUIPMENT:

| Asset | Description | Cal Date | Cal Due |
|--------------|----------------------------|-----------------|----------------|
| 138272 | LOAD CELL 0-1,000 # | 2/22/2013 | 2/22/2014 |
| 138039.1 | BAG WEIGHT- (300 lbs) | 12/07/2007 | VBU |
| 138039.2 | BAG WEIGH- (225 lbs) | 12/07/2007 | VBU |
| 138042 | SEATING IMPACT / 2 STATION | VBU | VBU |
| 138043 | BACK DURABILITY 0-300lbs | VBU | VBU |
| 138112 | GRADUATED RULE 36" | 08/27/2008 | 08/27/2013 |
| 138296 | STOPWATCH | 06/06/2012 | 06/06/2014 |
| 138170 | FRONT STABILITY WEIGHT | 04/14/2008 | VBU |
| 138012 | SCALE / 0-1,000 # | 12/14/2012 | 12/14/2013 |
| 138148 | DIGITAL PROTRACTOR | 09/26/2012 | 09/26/2013 |
| 138913.2 | LOAD CELL 0-10 K | 10/14/2012 | 10/14/2013 |
| 138279 | FORCE GAGE; DIGITAL 100LB | 04/02/2013 | 04/02/2014 |
| 138916.2 | TIMING BOX | VBU | VBU |
| 138047 | CASTER DURABILITY | VBU | VBU |
| 138906 | OBSTACLE PLATE 17" | 7/25/2006 | VBU |
| 138907 | OBSTACLE PLATE 17" | 7/25/2006 | VBU |
| 138908 | OBSTACLE PLATE 17" | 7/25/2006 | VBU |

5. BACK STRENGTH PROCEDURE - STATIC (Type I - Tilting Seat):

Date Tested: 3/25/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1 2011; Test No. 5
Functional Load: 200 lbf.
Proof Load: 300 lbf.
Number of Samples Tested: One (1)

Acceptance Criteria:

Functional Load: There shall be no loss of serviceability to the chair.

Proof Load: There shall be no sudden and major change in the structural integrity of the product. Loss of serviceability is acceptable.

Results:

| Sample ID | Static Load | Description of Results |
|-----------|-------------|------------------------|
| 3 | 200 | Pass |
| | 300 | Pass |

The submitted sample meets the acceptance criteria of the test described above.
Refer to the following page for photograph



Back Strength Test

7. BASE TEST - STATIC:

Date Tested: 11/26/2012
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 7
Time Duration of Test: 1 Minute
Functional Static Load: 2500 lbf.
Proof Static Load: 2500 lbf.
Number of Samples Tested: One (1)

Acceptance Criteria:

There shall be no sudden and major change in the structural integrity of the base. The center column may not touch the test platform during the load application.

Results:

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Base Test – Static

8. DROP TEST – DYNAMIC:

Date Tested: 3/26/2013
Condition of Test Sample: Production

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 8
Functional Load: 225 lbs.
Proof Load: 300 lbs.
Drop Height: 6"
Number of Samples Tested: One (1)

Acceptance Criteria:

Functional Load: No structural breakage or loss of serviceability, including stacking ability if applicable.

Proof Load: No sudden and major change in the structural integrity of the product. Loss of serviceability is acceptable.

Results:

| Sample Number | Highest Position | Results |
|---------------|---------------------------|---------|
| 3 | Functional Load - 225 lbs | Pass |
| | Proof Load - 300 lbs | Pass |

| Sample Number | Lowest Position | Results |
|---------------|---------------------------|---------|
| 3 | Functional Load - 225 lbs | Pass |
| | Proof Load - 300 lbs | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



DROP TEST – DYNAMIC

9. SWIVEL TEST - CYCLIC:

Dates Tested: 10/02/2012 – 10/08/2012
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 9

Number of Cycles:

Highest Seat Position: 60,000
Lowest Seat Position: 60,000
Rotation: 360°
Cycles per Minute: 5-15
Load in Seat: 250 lbs.
Number of Samples Tested: One (1)

Acceptance Criteria:

There shall be no loss of serviceability.

Results:

| Sample ID | Seat Position | Number of Cycles | Description of Results |
|-----------|-----------------|------------------|------------------------|
| 1 | Highest Setting | 60,000 | Pass |
| | Lowest Setting | 60,000 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Swivel Test – Cyclic

10. TILT MECHANISM TEST-CYCLIC: (Type I & Type II Chairs)

Dates Tested: 12/28/2012 – 1/10/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 10
Tilt Adjustments: Set all adjustments at normal use conditions.
Number of Cycles: 300,000
Cycles per Minute: 10 to 30
Load in Seat: 225 lbs.
Number of Samples Tested: One (1)

Acceptance Criteria:

There shall be no loss of serviceability to the tilt mechanism.

Results:

| Sample ID | Number of Cycles | Description of Results |
|-----------|------------------|------------------------|
| 1 | 300,000 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Tilt Mechanism Test-Cyclic

11. SEATING IMPACT TEST

Dates Tested: 3/11/2013 – 3/18/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 11

Section 11.3

Seat Center Impact Test

Bag Diameter: 16"
Bag Weight: 125 lbs.
Number Cycles: 100,000
Height of Drop: 1.2"
Cycles per Minute: 10 to 30

Section 11.4

Load Ease Test

Bag Diameter: 8"
Bag Weight: 165 lbs.
Number of Cycles Required: 20,000 to each Front Corner
Cycles per Minute: 10 to 30
Number of Samples Tested: One (1)

Acceptance Criteria:

There shall be no loss of serviceability to the chair after completion of both the Impact and Load Ease Tests.

Results:

Section 11.3

| Sample No. | Number of Cycles | Description of Results |
|------------|------------------|------------------------|
| 3 | 100,000 | Pass |

Section 11.4

| Location of Force | Number of Cycles | Description of Results |
|--------------------|------------------|------------------------|
| Left Front Corner | 20,000 | Pass |
| Right Front Corner | 20,000 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following pages for photographs.



Seating Impact Test



Front Load Ease

12. STABILITY TEST -DYNAMIC (Front and Rear):

Date Tested: 1/11/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 12
All of the chair's adjustable features shall be set for the most unstable conditions.

Chair Type: I

Weight in Seat

(Rear Stability Only):
Type I: 286 lbs. (13 disks)
Type II: 286 lbs (13 disks)
Type III: 132 lbs (6 disks)

Front Stability:

Alternative: N/A
Vertical Load: 135 Lbs
Horizontal Force: 4.5 Lbs
Number of Samples Tested: One (1)

Acceptance Criteria:

Front Stability: The chair shall not tip over as the result of the force application of 4.5 lbf..

Rear Stability:

The force to tip shall not be less than:
Type I: Chair must not tip over
Type II: Chair must not tip over
Type III: [F = 1.1 (47 – H) pounds force.]. H is the seat height in inches. For chairs with seat height equal to or greater than 710 mm (28.0 in.), a fixed force of 93 N (20.9 lbf.) shall be applied.

Results:

| Sample ID | Front Stability | Rear Stability | Results |
|-----------|------------------|----------------|---------|
| 2 | 21.5 lbf. to tip | Pass | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following pages for photographs.



Stability Test - Rear



Stability Test - Front

13. ARM STRENGTH TEST VERTICAL-STATIC:

Date Tested: 5/6/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 13
Functional Static Load: 169 lbf.
Proof Static Load: 253 lbf.
Number of Samples Tested: One (1)

Acceptance Criteria:

Functional Load: There shall be no loss of serviceability.

Proof Load: There shall be no sudden and major change in the structural integrity of the chair. Loss of serviceability is acceptable.

Results:

| Sample ID. | Static down Load (lbf.) | Description of Results |
|------------|-------------------------|------------------------|
| 1 | 169 | Pass |
| | 253 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Arm Strength Test Vertical-Static

14. ARM STRENGTH TEST- HORIZONTAL-STATIC:

Date Tested: 3/26/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 14
Functional Force: 100 lbf.
Proof Load: 150 lbf.
Number of Samples Tested: One (1)

Acceptance Criteria:

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

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.

Results:

| Chair | Load (lbs) | | Results |
|-------|-----------------|-----|---------|
| 4 | Functional Load | 100 | Pass |
| | Proof Load | 150 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Arm Strength Test- Horizontal-Static

15. BACK DURABILITY TEST-CYCLIC (Type I):

Dates Tested: 3/15/2013 – 3/20/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 15
Backrest Width: 17-1/2"
Number of Cycles Required: 120,000
Center Pull Location: 80,000
Off Center Pull Location: 40,000
Force Applied to Chair Back: 100 lbf.
Load in Seat: 225 lbs.
Cycles per Minute: 10 to 30
Number of Samples Tested: One (1)

Acceptance Criteria:

No structural breakage or loss of serviceability.

Results:

| Sample ID | Pull Location | Number of Cycles | Description of Results |
|-----------|-----------------|------------------|------------------------|
| 3 | Center Pull | 80,000 | Pass |
| | Off Center Pull | 40,000 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following pages for photographs.



Back Durability Test-Cyclic

17. CASTER/CHAIR BASE DURABILITY TEST - CYCLIC:

Dates Tested: 10/02/2012 – 10/08/2012
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 17
Number of Casters on Base: 5
Type of Casters (Hard or Soft): Hard
Travel Distance (Inches): 30 Inches
Number of Cycles Required: 100,000
Cycles over Obstacles: 2,000
Cycles over Smooth Plate: 98,000
Cycles per Minute: 9
Weight in Seat: 250 lbs.
Number of Samples Tested: One (1)

Acceptance Criteria:

Durability Cycling: There shall be no loss of serviceability.

Caster Retention: The caster shall not separate from the base as a result of the application of the 5 lb. force.

Results:

| Sample ID | Test Condition | Number of Cycles | Description of Results |
|-----------|-------------------|------------------|------------------------|
| 1 | Over Obstacles | 2,000 | Pass |
| | Over Smooth Plate | 98,000 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Caster/Chair Base Durability Test - Cyclic

21. ARM DURABILITY TEST- CYCLIC:

Dates Tested: 5/3/2013 – 5/6/2013
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 21
Load To Each Arm: 90 lbs.
Angle of Force: 10 Degrees from Vertical
Number of Cycles Required: 60,000
Cycles per Minute: 10 to 30
Number of Samples Tested: One (1)

Acceptance Criteria:

Structural breakage or loss of serviceability shall constitute failure. No failure that in any way would cause personal injury to the occupant shall be allowed.

Results:

| Sample ID | Number of Cycles | Description |
|-----------|------------------|-------------|
| 1 | 60,000 | Pass |

The submitted sample meets the acceptance criteria of the test described above. Refer to the following page for photograph.



Arm Durability Test – Cyclic

Revisions Made To Test Report

| Index | Date | Revision Description | Revised by |
|--------------|-------------|-----------------------------|---|
| 001 | 10-May-2013 | Initial release. | Lynwood Pearson <i>Lynwood Pearson</i> |
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