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EMECO
Date: April 25, 2016

Report No.:102558112GRR-001
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Test Report For:

Emeco

**ANSI/BIFMA X5.1-2011
CHAIR TEST STANDARD**

Alfi Arm Chair

Lynwood Pearson
Project Manager

Anthony Serge
Reviewer



Intertek



Intertek



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DATE RECEIVED: 4/8/2016
DATES TESTED: 4/8/2016 - 4/21/2016

DESCRIPTION OF SAMPLES:

Part Description: Alfi Arm 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>
6	Back Rest Strength-Non-Tilt
8	Drop-Dynamic
11	Seating Durability
12	Stability
13	Arm Strength-Vertical
14	Arm Strength-Horizontal
16	Backrest Durability-Non-Tilt
18	Leg Strength
21	Arm Durability

CONCLUSION:

Test	Results	Notation
ANSI/BIFMA 5.1-2011 #6 Back Strength	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #8 Drop Test	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #11 Seating Durability	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #12 Stability	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #13 Vertical Arm Strength	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #14 Horizontal Arm Strength	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #16 Backrest Durability	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #18 Leg Strength	Compliant	No loss of serviceability.
ANSI/BIFMA 5.1-2011 #21 Armrest Durability	Compliant	No loss of serviceability.

TEST EQUIPMENT:

Asset	Description	Cal Date	Cal Due
138272	LOAD CELL 0-1,000 #	10/07/2015	10/07/2016
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
138379	STOPWATCH	09/02/2014	09/02/2016
138170	FRONT STABILITY WEIGHT	04/14/2008	VBU
138012	SCALE / 0-1,000 #	11/12/2015	11/12/2016
138148	DIGITAL PROTRACTOR	09/14/2015	09/14/2016
138279	FORCE GAGE; DIGITAL 100LB	03/04/2016	03/04/2017
138916.2	TIMING BOX	VBU	VBU
138112	GRADUATED RULE 36"	10/11/2013	10/11/2018
138343	Arm Durability Station	VBU	VBU
138325	4 Station Backrest Durability Machine	VBU	VBU
138252	MULTILOAD TESTER	VBU	VBU
138345	3 Station Seat Impact	VBU	VBU
138325.1	Load cell 1 on back durability machine.	07/23/2015	07/23/2016
138325.2	Load cell 2 on back durability machine.	07/23/2015	07/23/2016
138325.3	Load cell 3 for back durability machine.	07/23/2015	07/23/2016
138325.4	Load cell 4 on back durability machine.	07/23/2015	07/23/2016
138283	LOAD CELL 1000 LBF	01/11/2016	01/11/2017

6. BACK STRENGTH PROCEDURE - STATIC (Type II-III – Non-Tilt Seat):

Date Tested: 4/21/2016
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1 2011; Test No. 6
Functional Load: 150 lbf.
Proof Load: 250 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
1	150 lbf.	Pass
	250 lbf.	Pass

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



BACK STRENGTH PROCEDURE - STATIC

8. DROP TEST – DYNAMIC:

Date Tested: 4/21/2016
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 ID	Drop Weight	Results
1	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

11. SEATING IMPACT TEST

Dates Tested: 4/8/2016 – 4/12/2016
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
1	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



Load Ease Test

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

Date Tested: 4/8/2016
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: III

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.

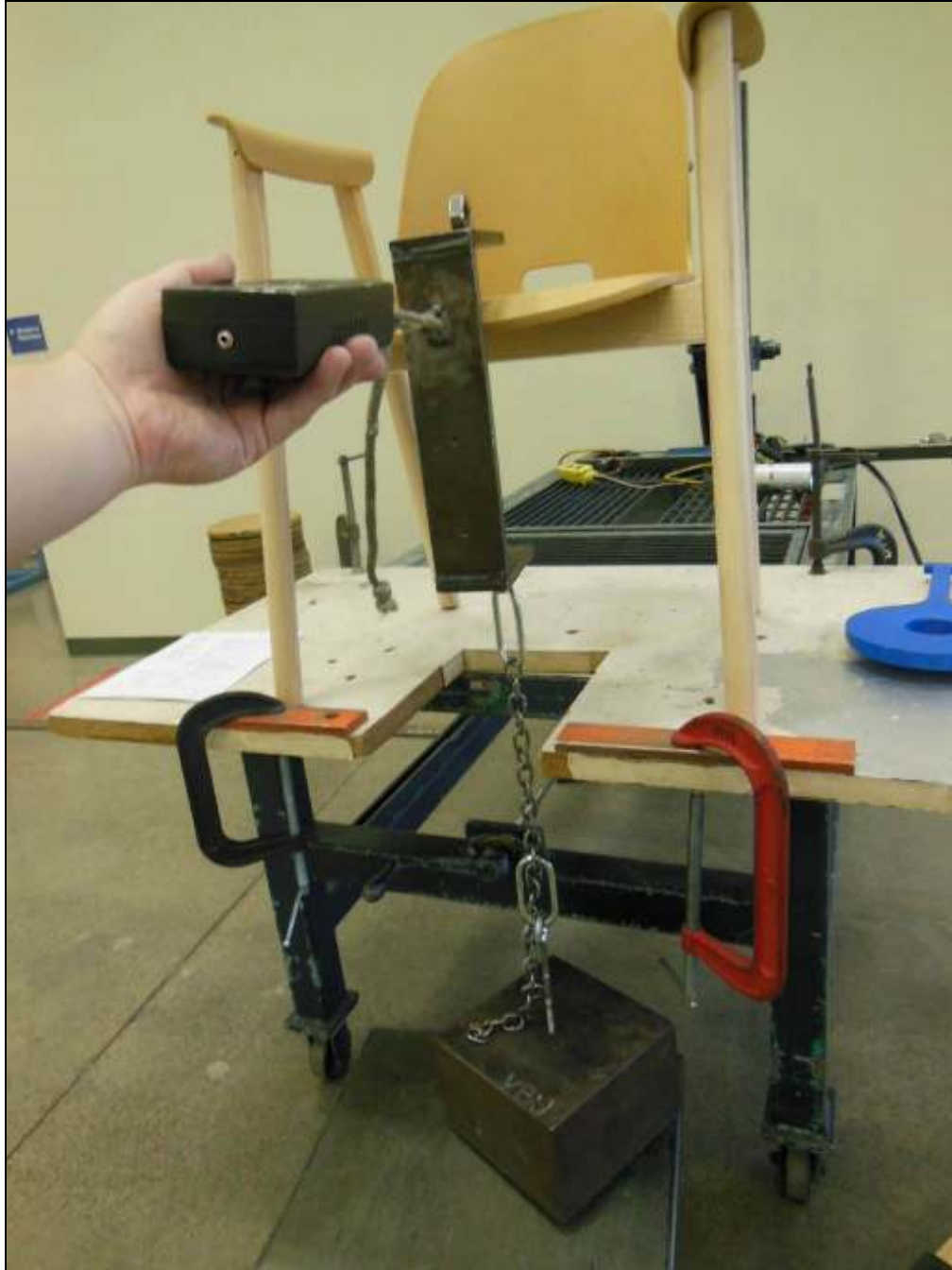
Results:

Sample ID	Seat Height	Front Stability	Rear Stability	Results
1	18"	10.1 lbf. to tip	46.3 lbf. to tip	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: 4/21/2016
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 lbf.	Pass
	253 lbf.	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: 4/21/2016
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:

Sample ID.	Load (lbf)		Results
1	Functional Load	100 lbf.	Pass
	Proof Load	150 lbf.	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

16. BACK DURABILITY TEST-CYCLIC (Type III):

Dates Tested: 4/12/2016 – 4/18/2016
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 16
Backrest Width: 12”
Number of Cycles Required: 120,000
Center Pull Location: 80,000
Off Center Pull Location: 40,000
Force Applied to Chair Back: 75 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
1	Center Pull	80,000	Pass
	Off Center Pull	40,000	Pass

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



BACK DURABILITY TEST-CYCLIC

18. LEG STRENGTH TEST - FRONT & SIDE APPLICATION:

Date Tested: 4/21/2016
Condition of Test Sample: New

Test Procedure:

Test Method: ANSI/BIFMA X5.1-2011; Test No. 18

Front to Rear Leg Application:

Functional Load: 75 lbf. (Load Each Leg)
Proof Load: 113 lbf. (Load Each Leg)

Side Load Application:

Functional Load: 75 lbf. (Load Each Leg)
Proof Load: 113 lbf. (Load Each Leg)

Number of Samples Tested: One (1)

Acceptance Criteria:

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

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

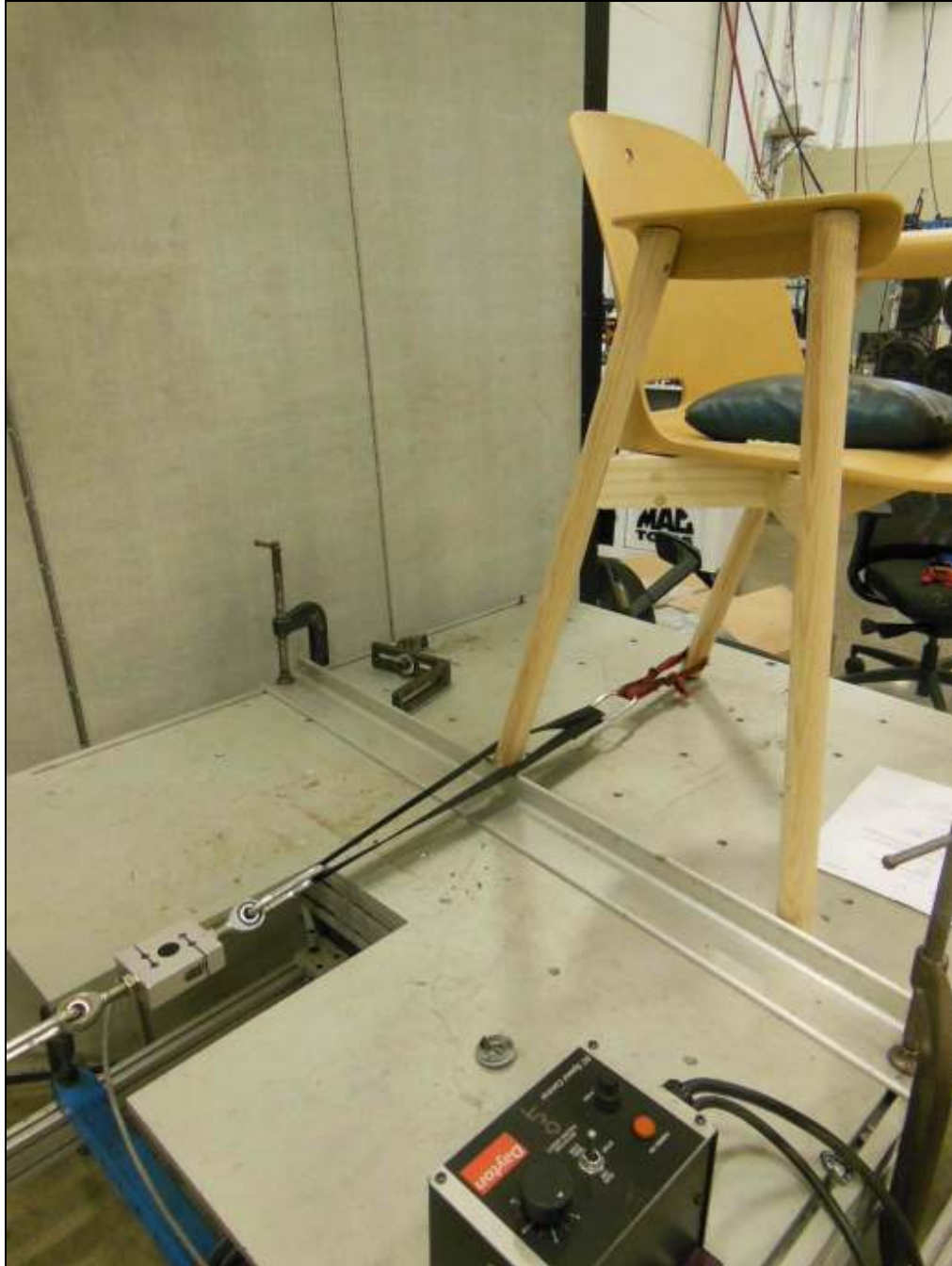
Results:

Sample ID	Load Application	Functional	Proof	Description of Results
1	Side to Side (Rear Side)	75 lbf.	113 lbf	Pass
	Side to Side (Front Side)	75 lbf.	113 lbf	Pass
	Front to Rear (Left Side)	75 lbf.	113 lbf.	Pass
	Front to Rear (Right Side)	75 lbf.	113 lbf.	Pass

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



LEG STRENGTH TEST - FRONT APPLICATION



LEG STRENGTH TEST - SIDE APPLICATION

21. ARM DURABILITY TEST- CYCLIC:

Dates Tested: 4/18/2016 – 4/21/2016
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 of Results
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

