

# EMECO INDUSTRIES INC. TEST REPORT

**SCOPE OF WORK**

ANSI/BIFMA X5.1-2017 GENERAL PURPOSE OFFICE CHAIRS testing on 1951 Chair

**REPORT NUMBER**

104188936GRR-001

**ISSUE DATE**

06-Jan-2020

**PAGES**

24

**DOCUMENT CONTROL NUMBER**

Per RT-AMER-L-GRR-DUR-001

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## TEST REPORT FOR EMECO INDUSTRIES INC.

Report No.: 104188936GRR-001

Date: 06-Jan-2020

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### SECTION 1

#### CLIENT INFORMATION

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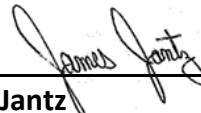
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**Lynwood Pearson**  
Test Engineer



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**James Jantz**  
Project Reviewer

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**SECTION 2**

**SUMMARY AND CONCLUSION**

Date Received: 16-Dec-2019  
 Dates Tested: 17-Dec-2019 to 03-Jan-2020

**DESCRIPTION OF SAMPLES AS RECEIVED**

Part Description: 1951 Chair  
 Condition of Samples: New production  
 Number of Samples Received: One (1)

**WORK REQUESTED/APPLICABLE DOCUMENTS**

ANSI/BIFMA X5.1-2017 GENERAL PURPOSE OFFICE CHAIRS  
 Intertek quote Qu-01036257

**CONCLUSION**

SAMPLE ID	ANSI/BIFMA X5.1-2017	RESULTS
1	6. Backrest Strength Test - Static - Type III	CONFORMING
1	7. Drop Test Dynamic	CONFORMING
1	10. Seating Durability Tests – Cyclic	CONFORMING
1	11. Stability Tests (Front and Rear)	CONFORMING
1	15. Backrest Durability Test – Cyclic – Type II and Type III	CONFORMING
1	17. Leg Strength Test – Front and Side Application	CONFORMING
1	24. Structural Durability Test – Cyclic:	CONFORMING

**SAMPLE DISPOSITION**

The sample remains at Intertek at the issuance of this report.

**TEST EQUIPMENT:**

ASSET #	EQUIPMENT	CAL DATE	NEXT DUE
192262244	Stopwatch	06/19/5019	06/19/2020
138042	2 Station Seat Impact	VBU	VBU
138148	DIGITAL PROTRACTOR	12/18/2019	12/18/2020
138394	0 to 1000lb Load Cell	8/21/2019	8/21/2020
138012	Scale/0-1,000#	9/30/2019	9/30/2020
138519	48" STRAIGHT-EDGE	12/22/2019	12/22/2020
138916.2	TIMING BOX	VBU	VBU
138279	FORCE GAUGE	12/30/2019	12/30/2020
138325	4 Station Backrest Durability Machine	VBU	VBU
138325.1	Load cell used for station 1 on back durability machine.	8/21/2019	8/21/2020
138427	1000LB LOAD CELL WITH DISPLAY	6/4/2019	6/4/2020

**SECTION 3**

**6. BACKREST STRENGTH TEST – STATIC – TYPE III:**

Date Received: 16-Dec-2019  
 Date Tested: 03-Jan-2020  
 Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
 Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 6:

Functional Load: 150 lbf.  
 Proof Load: 225 lbf.

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 6:

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

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

**RESULTS:**

SAMPLE ID	STATIC LOAD	DURATION	RESULTS
1	150 lbf.	One minute	Conforming
	225 lbf.	One minute	Conforming

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



Backrest Strength Test – Static

**7. DROP TEST – DYNAMIC:**

Date Received: 16-Dec-2019  
Date Tested: 02-Jan-2020  
Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 7:  
Functional Load: 225 lbs.  
Proof Load: 300 lbs.  
Drop Height: 6"

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 7:

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 product. Loss of serviceability is acceptable.

**RESULTS:**

SAMPLE ID	DROP WEIGHT	RESULTS
1	Functional Load: 225 lbs.	Conforming
	Proof Load: 300 lbs.	Conforming

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



**Drop Test – Dynamic**



**10. SEATING DURABILITY TESTS – CYCLIC:**

Date Received: 16-Dec-2019  
 Date Tested: 17-Dec-2019 to 23-Dec-2019  
 Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
 Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 10:

Test No. 10.3 Impact Test  
 Bag Diameter: 16”  
 Bag Weight: 125 lbs.  
 Number of Cycles: 100,000  
 Height of Drop: 1.4”  
 Cycles per Minute: 10 to 30

Test No. 10.4 Front Corner Load-Ease Test – Cyclic – Off-center  
 Bag Diameter: 8”  
 Bag Weight: 200 lbs.  
 Number of Cycles Required: 20,000 to each Front Corner  
 Number Cycles: 10 to 30

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 10:

There shall be no loss of serviceability to the chair after completion of both the Impact and Load Ease Tests. If applicable, the chair base (center structure) shall not touch the test platform as a result of the impact loads.

**RESULTS:**

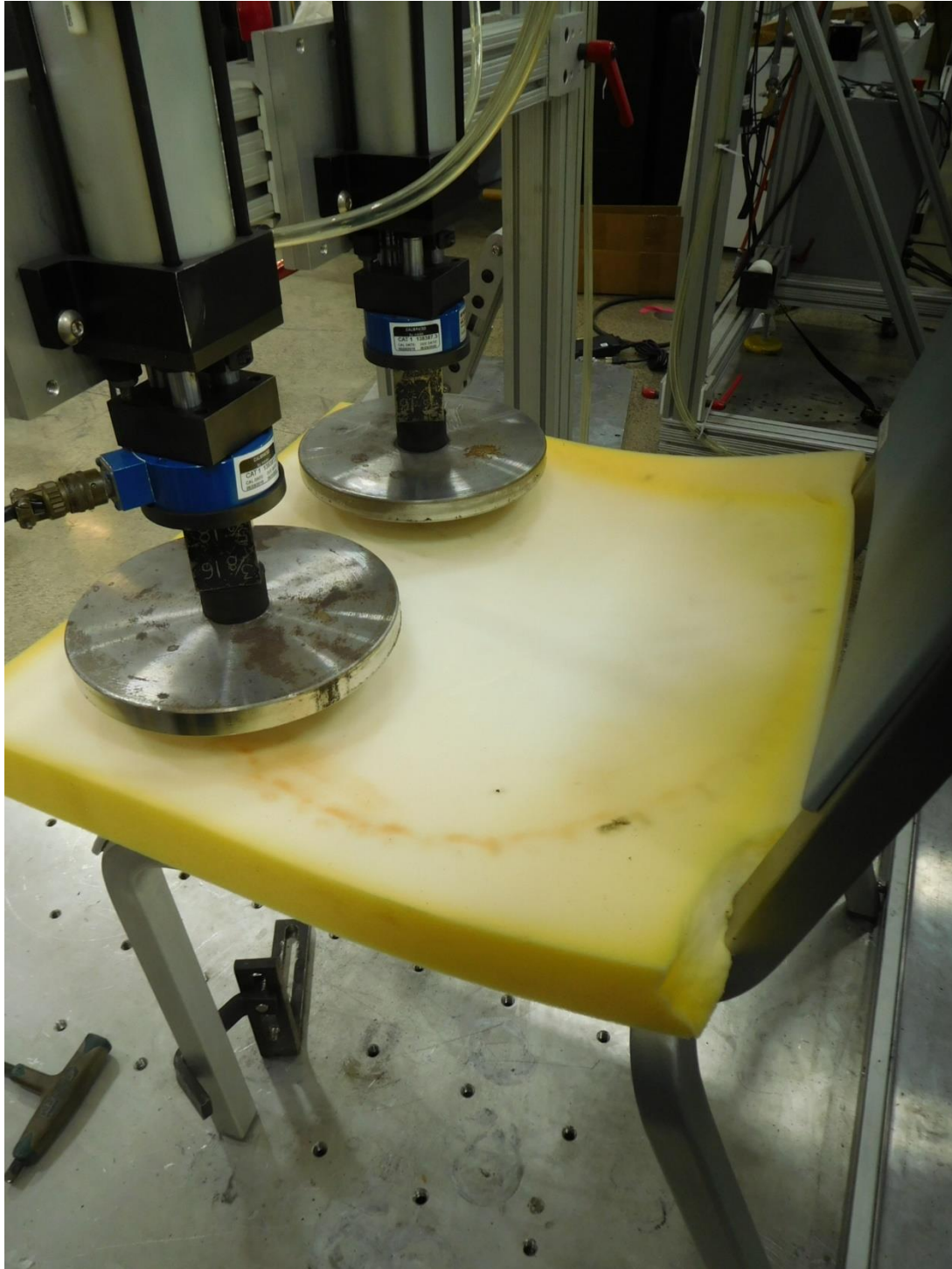
SAMPLE NO.	CYCLES	RESULTS
1	100,000	Conforming

Left Front Corner	20,000	Conforming
Right Front Corner	20,000	Conforming

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



**Impact Test**



Load Ease Test

**11. STABILITY TESTS (FRONT AND REAR):**

Date Received: 16-Dec-2019  
 Date Tested: 30-Dec-2019  
 Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
 Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 11:  
 All of the chair's adjustable features shall be set for the most unstable conditions.

Chair Type: III

Test No. 11.3 Rear Stability

Weight in Seat  
 Type I: 286 lbs. (13 disks)  
 Type II: 286 lbs. (13 disks)  
 Type III: 132 lbs. (6 disks)

Test No. 11.4 Front Stability

Alternative: N / A  
 Vertical Load: 135 lbs.  
 Horizontal Force: 4.5 lbf.

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 11:

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.

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

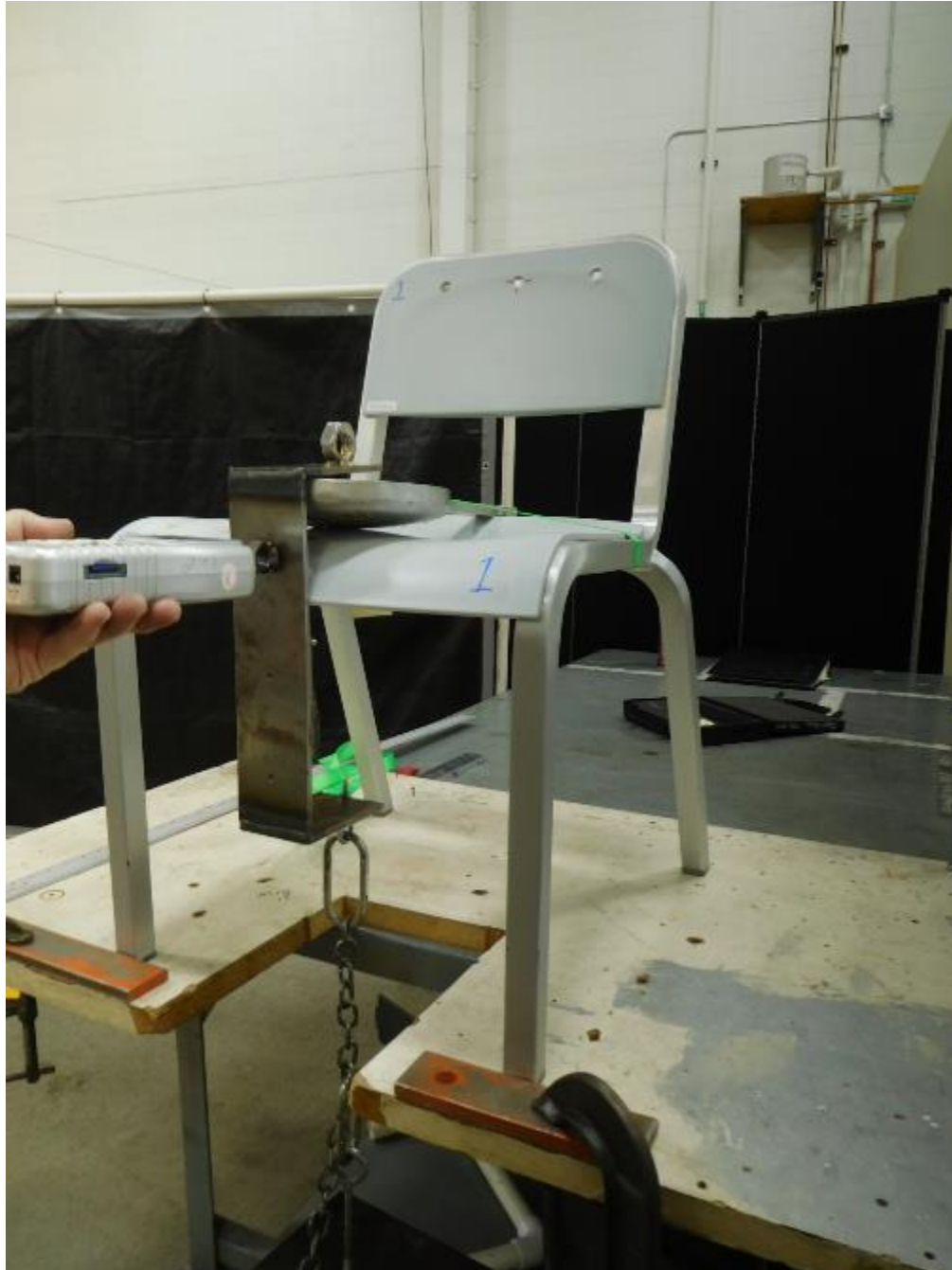
**RESULTS:**

SAMPLE ID	SEAT HEIGHT	FRONT STABILITY	REAR STABILITY	RESULTS
1	18"	28.7 lbf. to tip	62.4 lbf. to tip	Conforming

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



Rear Stability



**Front Stability**

**15. BACKREST DURABILITY TEST – CYCLIC – TYPE II AND TYPE III:**

Date Received: 16-Dec-2019  
 Date Tested: 23-Dec-2019 to 30-Dec-2019  
 Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
 Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 15:

Backrest Width: 16.25"  
 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: 240 lbs.  
 Cycles per Minute: 10 to 30

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 15:  
 No structural breakage or loss of serviceability.

**RESULTS:**

SAMPLE ID	PULL LOCATION	CYCLES	RESULTS
1	Center Pull	80,000	Conforming
	Off Center Pull	20,000 left side	Conforming
		20,000 right side	Conforming

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



**Backrest Durability Test – Cyclic – Center Pull**





**Backrest Durability Test – Cyclic – Off-Center Pull**



**Backrest Durability Test – Cyclic – Off-Center Pull**

**17. LEG STRENGTH TEST – FRONT AND SIDE APPLICATION:**

Date Received: 16-Dec-2019  
 Date Tested: 03-Jan-2020  
 Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
 Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 17:

Test No. 17.3

Front to Rear Leg Application:

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

Test No. 17.4

Side Load Application:

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

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 17:

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.

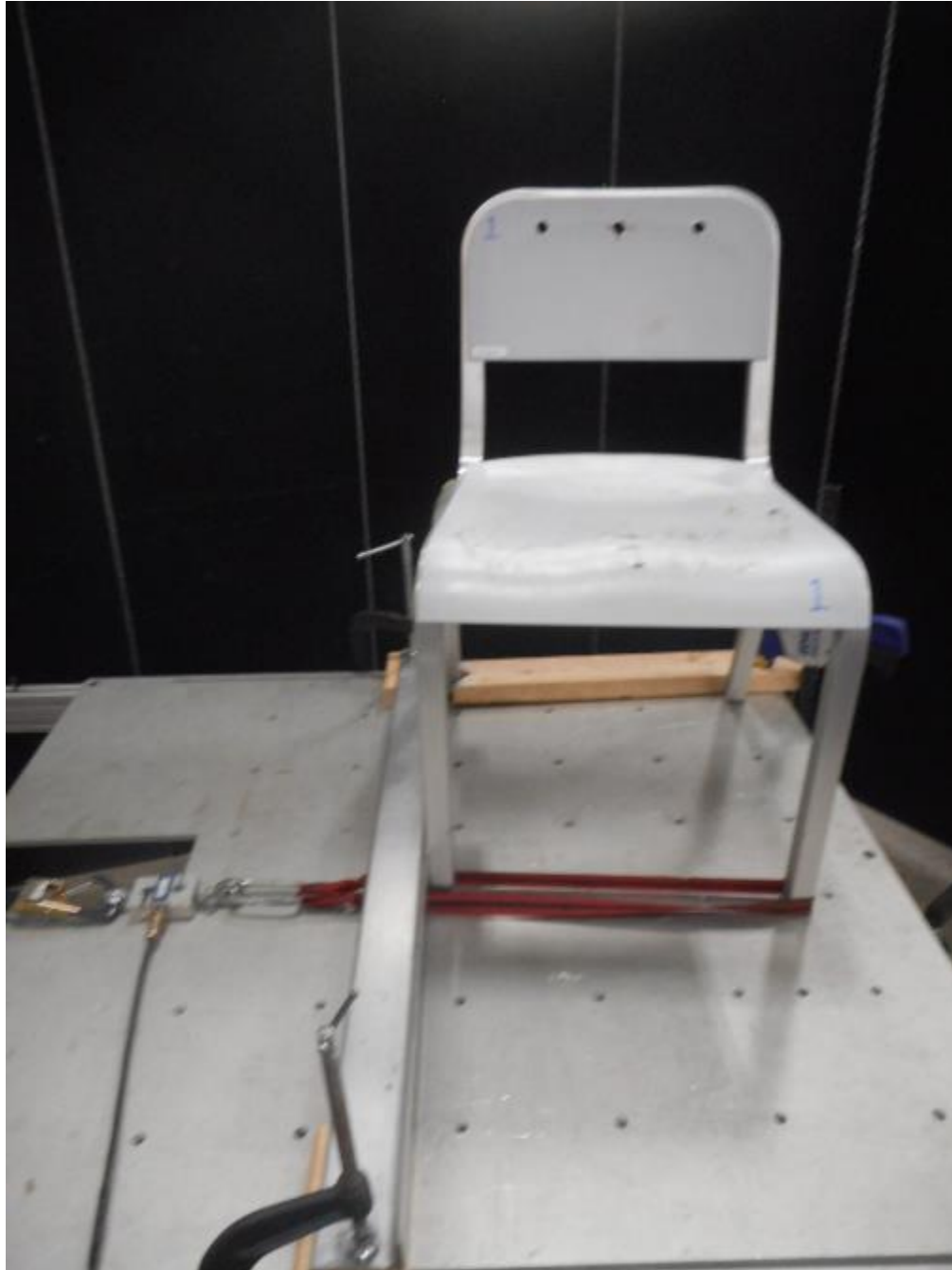
**RESULTS:**

SAMPLE ID	LOAD APPLICATION	FUNCTIONAL	RESULTS	PROOF	RESULTS
1	Side to Side (Rear Side)	75 lbf.	Conforming	113 lbf.	Conforming
	Side to Side (Front Side)	75 lbf.	Conforming	113 lbf.	Conforming
	Front to Rear (Left Side)	75 lbf.	Conforming	113 lbf.	Conforming
	Front to Rear (Right Side)	75 lbf.	Conforming	113 lbf.	Conforming

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



**Leg Strength Test – Front Load**



**Leg Strength Test – Side Load**

**24. STRUCTURAL DURABILITY TEST – CYCLIC:**

Date Received: 16-Dec-2019  
Date Tested: 26-Dec-2019 to 27-Dec-2019  
Location Tested: Intertek Kentwood, MI

**DESCRIPTION OF SAMPLES:**

Part Description: 1951 Chair  
Number of Samples Tested: One (1)

**TEST PROCEDURE:**

Test Method: Per ANSI/BIFMA X5.1-2017 Test No. 24:

Load in Seat: 240 lbs.  
Force Applied: 75 lbf.  
Number of Cycles Required: 25,000  
Cycles per Minute: 20 ± 10 cycles per minute

**ACCEPTANCE CRITERIA:**

Per ANSI/BIFMA X5.1-2017 Test No. 24:  
There shall be no loss of serviceability.

**RESULTS:**

SAMPLE ID	CYCLES	RESULTS
1	25,000	Conforming

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



Structural Durability Test – Cyclic

**SECTION 4**

**REVISIONS MADE TO TEST REPORT:**

DATE	REVISION DESCRIPTION	REVISED BY	REVISED BY
06-Jan-2020	Initial release.	Lynwood Pearson	