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SUDEX ARGENTINA SRL  
Date: May 10, 2013  
P. O. No.: BH20120926

Report No.:100917074GRR-001D

Page 1 of 30

**Test Report For:**  
**SUDEX ARGENTINA SRL**  
**ANSI/BIFMA X5.1-2011**  
**CHAIR TEST STANDARD**  
**NIMBO 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: NIMBO 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	01404/02/2013	04/02/2
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: There shall be no loss of serviceability to the chair, 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	Descriptio 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	Results	Description of R
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 dis  
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  
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 to the chair.

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.)	Result	Description of R
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: There shall be no loss of serviceability to the chair.  
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**

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