Beneficial Designs Inc.

Wheelchair Seat Cushion Testing Report

TEST INSTITUTION

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TEST CUSHION

Manufacturer	Action Products Inc.	Width (cm)	45.7 (18 in)
Product Line Name	Xact	Length (cm)	41.3 (16.3 in)
Model Name	Lite	Thickness (cm)	8.1 (3.2 in)
Manufacturer's Lot #	Not Applicable	Weight (gm)	1,406
Date of Manufacture	December 2005	Recommended maximum user weight (kg)	113 (250 lb)
Serial Number	Not Applicable		

HCPCS Seat Cushion Code: K0652 Skin protection cushion, width <22 in

TESTING METHODOLOGY

Simulation testing was conducted according to the DMERC – Local Medical Review Policy – Final – Wheelchair Seating, Spring 2004[1].

CLI used 40 mm Date(s) of tests 15-16 January 2005

SUMMARY OF RESULTS

Prior to simulated use testing:
- Loaded contour depth test ..... PASSED
- Overload test for measuring bottoming out ..... PASSED

After simulated use testing:
- Loaded contour depth test ..... PASSED
- Overload test for measuring bottoming out ..... PASSED

Simulation tests demonstrated a loaded contour depth of at least 40 mm with an overload deflection of at least 5 mm.

Following testing simulating 18 months of use, simulation tests demonstrated a loaded contour depth of at least 40 mm with an overload deflection of at least 5 mm.

Minimum structural characteristics assessment for positioning cushions ..... Not Applicable

Report prepared by: Allen Siekman, Testing Supervisor 17 January 2005 Date

POSITIONING CUSHION STRUCTURAL CHARACTERISTICS

The positioning cushion exhibited the following structural characteristic(s):

Not Applicable

* If the cushion is coded as K0654, K0655, K0656, and K0657 and has two or more structural characteristics or two or more air compartments, then the cushion is determined to have passed the structural characteristic assessment.

CUSHION LOADING INDENTERS

One cushion-loading indenter(s) (CLIs) was used to test the cushion:

1) Loaded Contour Jig (LCJ)

The LCJ met the specific design features of acceptable CLIs as specified in the SADMERC Wheelchair Cushion Testing Methodology[2]. The results obtained with the LCJ are reported in the *Summary of Results* on page 1.

TEST RESULTS – PRIOR TO SIMULATED USE TESTING

Date of test: 15 January 2005

Testing room conditions: Temperature (C) 21.7; Relative Humidity (%) 48

Loaded Contour Depth with LCJ indenter	Test #1	Test #2	Test #3	Result
Lateral buttons of the CLI contacted the cushion when loaded to 140 N (31 lb)	Yes	Yes	Yes	Pass

Overload Test with LCJ indenter	Test #1	Test #2	Test #3	Result
1) Height of CLI when loaded to 140 N (31 lb) (standard load) (mm)	36.19	33.96	33.09	- - -
2) Height of CLI when loaded to 187 N (41 lb) (overload) (mm)	32.65	30.70	30.05	- - -
3) Height at standard load (#1) minus height at overload (#2) (mm)	3.54	3.26	3.04	- - -
4) Value in #3 rounded to the nearest 5 mm (mm)	5	5	5	- - -
5) Overload deflection* (mm) (median of the 3 values in #4)	- - -	- - -	- - -	5 Pass

* If the overload deflection is greater than or equal to 5 mm, then the cushion is determined not to have bottomed out during the test.

SIMULATED USE TESTING

To simulate cushion use, the test cushion was subjected to cyclic loading in a heated chamber. The test cushion was preconditioned for 30 minutes in a test chamber maintained at 70 ±2 degrees C. The test cushion was then loaded to 500 ±10 Newtons (112 ±2 pounds) for 7,500 or 11,000 cycles (depending upon the type of cushion) at a rate of 30 times per minute using the RCLI in the test chamber maintained at 70 ±2 degrees C.

The number of cycles was determined as follows:

For testing simulating 12 months of use:
40 pressure reliefs per day x 30 days per month x 12 months x RF ≈ 7,500 cycles

For testing simulating 18 months of use:
40 pressure reliefs per day x 30 days per month x 18 months x RF ≈ 11,000 cycles

where RF = 0.5, the reduction factor for testing at an elevated temperature.

This cushion was tested to 22,000 cycles.

Preconditioning of test cushion began at 1105 hrs

Test chamber temperature (deg C) 70

Date of test 15 January 2005

Time test started 1140 hrs

TEST RESULTS – AFTER SIMULATED USE TESTING

Date of test 16 January 2005

Testing room conditions Temperature (C) 22.2

Relative Humidity (%) 49

Loaded Contour Depth with LCJ indenter	Test #1	Test #2	Test #3	Result
Lateral buttons of the CLI contacted the cushion when loaded to 140 N (31 lb)	Yes	Yes	Yes	Pass

Overload Test with LCJ indenter	Test #1	Test #2	Test #3	Result
1) Height of CLI when loaded to 140 N (31 lb) (standard load) (mm)	33.30	32.19	31.97	- - -
2) Height of CLI when loaded to 187 N (41 lb) (overload) (mm)	30.29	29.42	28.95	- - -
3) Height at standard load (#1) minus height at overload (#2) (mm)	3.01	2.77	3.02	- - -
4) Value in #3 rounded to the nearest 5 mm (mm)	5	5	5	- - -
5) Overload deflection* (mm) (median of the 3 values in #4)	- - -	- - -	- - -	5 Pass

* If the overload deflection is greater than or equal to 5 mm, then the cushion is determined not to have bottomed out during the test.

COMMENTS

None

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[1] DMERC – Local Medical Review Policy – Final – Wheelchair Seating, Spring 2004 (n.d.). Retrieved March 18, 2004, from Palmetto GBA Web site: http://www.palmettogba.com/palmetto/lmrps_dmerc.nsf/final/2A0A7017B7FBE65585256D1E0044C7BB?OpenDocument

[2] ISO/DIS 16840-2, Test methods for determining the physical and mechanical characteristics of devices intended to manage tissue integrity – Part 2 Seat cushions [working draft] (2003-10-30). Retrieved March 18, 2004, from the University of Pittsburgh Wheelchair Standards Information Web site: http://www.wheelchairstandards.pitt.edu/WCS_S/WCS_S_ISO/WCS_S_ISO_WG11/WCS_S_ISO_WG11_pdf/WCS_S_ISO_WG11_Stds_pdf/ISO_16840_2_DIS.pdf