



PROJECT NUMBER:

3013 71-5129

PAGE:

1 of 4

DATE:

September 30, 1997

MAXIM TECHNOLOGIES, INC./TWIN CITY TESTING
662 Cromwell Avenue
St. Paul, Minnesota 55114

**BODY INTERFACE PRESSURE POINT TESTING
CONDUCTED ON A BRODA ELITE TILT
RECLINER MODEL 785**

Prepared for:
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Client Purchase Order Number: Contract 9/9/97

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The test results contained in this report pertain only to the samples submitted for testing and not necessarily to all similar products.

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BODY INTERFACE PRESSURE POINT TEST

INTRODUCTION:

This report documents the results of interface pressure point testing conducted on a Broda Elite Tilt Recliner Model 785 submitted by Broda Seating. This work was requested by Mr. Steve Brotherston of Broda on September 9, 1997 with the testing conducted September 26, 1997.

TEST RESULTS SUMMARY:

**Average Pressure (mm Hg)-All Subjects (4)
(Standard Deviation Values in Parentheses)**

Position	<u>ELITE TILT RECLINER MODEL 785</u>			
	<u>Upright</u>	<u>Incline</u>	<u>Recline</u>	<u>control¹</u>
Right Ischial Tuberosity	30 (11.1)	21 (10.1)	19 (6.1)	58 (34.7)
Left Ischial Tuberosity	35 (12.0)	22 (10.6)	18 (6.7)	65 (45.6)
Sacral Prominence (Coccyx)	28 (12.0)	21 (9.9)	18 (7.8)	58 (28.4)
Right Thigh	16 (6.6)	9 (5.6)	6 (2.6)	19 (7.5)
Left Thigh	17 (8.0)	9 (6.0)	6 (3.0)	17 (6.0)
Scapula	n/a	18 (14.0)	19 (16.0)	n/a

¹ Control numbers were derived from a standard wheelchair with a collapsible seating area and were included as a comparison.

It is the policy of Maxim Technologies, Inc. to use recognized test procedures whenever possible, such as ASTM, ANSI, ISO etc. To Maxim's knowledge, no standard procedure exists for interface body contact pressure testing at the present time. The test method employed for this analysis is based on sound laboratory practice. Precautions were employed to position the sensor correctly in each case. The pressure monitor was calibrated prior to testing.

SAMPLE IDENTIFICATION:

The production health care seating system was identified as a Broda Elite Tilt Recliner, Model 785 manufactured by Broda Seating. The Tilt Recliner system was designed for long term care.

The chair seat tilted from flat to 45° from horizontal and the chair back reclined from 97° to 180° from the angle of the seat. These changes were accomplished by independently operated gas cylinders and were infinitely adjustable within these ranges. These cylinders were reported to be intended as shock absorbers for agitated patients who have incessant choreiform movement.

The chair seat, back, and leg rest consisted of 1-1/2" wide by 1/8" thick contoured vinyl strapping, with gaps between the strapping to allow for drainage and air circulation. The footrest was height adjustable to accommodate different leg lengths. This unit was equipped with removable wings, shoulder bolsters, removable side panels, side pads, neck rest cushion and footrest cushions. The padding consisted of expanded virgin vinyl with fabric backing. A 1" thick seat pad and 5/8" thick back pad covered with soft vinyl and cotton terri-cloth covers completed the Broda Elite Tilt Recliner.

TEST PROCEDURE:

A Talley Oxford Pressure Monitor - Model MKII was used for this analysis. The Elite Tilt Recliner was evaluated in three different positions: upright, incline, and recline. Four subjects were used of various heights and weights and tested three times each at various body locations. The subjects were dressed in an appropriate size cotton sweat suit to ensure proper placement of the 4" x 5" - 12 sensor pad. Positioning of the sensor pad was accomplished by both the subject and experimenter. Repositioning between the three replications conducted on each subject was also part of the test procedure. The subjects weight, height and gender are listed below:

<u>Subject</u>	<u>Height</u>	<u>Weight</u>	<u>Sex</u>
1	5' 4"	105 lbs	F
2	5' 7"	125 lbs	F
3	5' 6"	140 lbs	F
4	5' 6"	165 lbs	M

TEST RESULTS:

**Average Pressure (mm Hg)-Individual Subjects
(Standard Deviation Values in Parentheses)**

Elite Tilt Recliner - upright

	<u>Sub 1</u>	<u>Sub 2</u>	<u>Sub 3</u>	<u>Sub 4</u>	<u>Ave.</u>	<u>Std. Dev.</u>
Right Ischial Tuberosity	31	31	20	38	30	(11.1)
Left Ischial Tuberosity	37	34	28	41	35	(12.0)
Sacral Prominence (Coccyx)	24	24	21	41	28	(12.0)
Right Thigh	10	12	24	15	16	(6.6)
Left Thigh	11	13	23	19	17	(8.0)

Elite Tilt Recliner - incline

	<u>Sub 1</u>	<u>Sub 2</u>	<u>Sub 3</u>	<u>Sub 4</u>	<u>Ave.</u>	<u>Std. Dev.</u>
Right Ischial Tuberosity	27	23	15	21	21	(10.1)
Left Ischial Tuberosity	26	22	15	24	22	(10.6)
Sacral Prominence (Coccyx)	21	21	12	28	21	(9.9)
Right Thigh	6	6	16	7	9	(5.6)
Left Thigh	4	7	15	10	9	(6.0)
Scapula	16	15	18	23	18	(14.0)

PROJECT NUMBER: 3013 71-5129

PAGE: 4 of 4
DATE: September 30, 1997

TEST RESULTS: (Cont)

Elite Tilt Recliner - recline

	<u>Sub 1</u>	<u>Sub 2</u>	<u>Sub 3</u>	<u>Sub 4</u>	<u>Ave.</u>	<u>Std. Dev.</u>
Right Ischial Tuberosity	19	17	14	24	19	(6.1)
Left Ischial Tuberosity	19	17	13	24	18	(6.7)
Sacral Prominence (Coccyx)	17	17	14	22	18	(7.8)
Right Thigh	5	5	7	9	6	(2.6)
Left Thigh	5	5	8	7	6	(3.0)
Scapula	21	17	19	21	19	(16.0)

Maximum Pressure (mm Hg)-Individual Subjects

Elite Tilt Recliner - upright

	<u>Sub 1</u>	<u>Sub 2</u>	<u>Sub 3</u>	<u>Sub 4</u>	<u>Ave.</u>
Right Ischial Tuberosity	58	46	39	49	48
Left Ischial Tuberosity	81	57	41	55	59
Sacral Prominence (Coccyx)	38	56	32	55	45
Right Thigh	38	16	27	27	27
Left Thigh	21	19	30	32	26

Elite Tilt Recliner - incline

	<u>Sub 1</u>	<u>Sub 2</u>	<u>Sub 3</u>	<u>Sub 4</u>	<u>Ave.</u>
Right Ischial Tuberosity	60	37	23	44	41
Left Ischial Tuberosity	52	44	23	46	41
Sacral Prominence (Coccyx)	47	40	20	38	36
Right Thigh	10	10	27	21	17
Left Thigh	9	13	19	28	17
Scapula	39	45	28	46	40

Elite Tilt Recliner - recline

	<u>Sub 1</u>	<u>Sub 2</u>	<u>Sub 3</u>	<u>Sub 4</u>	<u>Ave.</u>
Right Ischial Tuberosity	27	26	23	33	27
Left Ischial Tuberosity	30	28	22	34	29
Sacral Prominence (Coccyx)	27	26	20	31	26
Right Thigh	8	11	11	13	11
Left Thigh	10	12	11	21	14
Scapula	51	54	31	39	44

REMARKS:

The maximum value was obtained from the 12 individual sensors and the results of all subjects averaged.

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