

TEST REPORT FOR:
**Product Design Group Stellar Tilt
Manual Wheelchair (100 kg)**

REFERENCED DOCUMENTS
ISO7176-1:1999, ISO7176-3:2003, ISO7176-5:2008
ISO7176-7:1998, ISO7178-8:1998, ISO7176-13:1989,
ISO7176-15:1996, ISO7176-22:2000

LABORATORY REFERENCE
491804

6th November 2012



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TEST REPORT

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PRODUCT

Job no: 491804

Name and Model No:

Product Design Group Stellar tilt
Manual wheelchair

Serial no(s) of test sample:

16200

Maximum user mass:

100 kg

Documents used in testing

ISO7176-1:1999, ISO7176.3:2003, ISO7176.5:2008
ISO7176.7:1998, ISO7176-8:1998, ISO 7176.13:1989
ISO7176-15:1996, ISO7176-22:2000

SUPPLIER

Name:

Product Design Group

Address:

Unit 103-318 East Kent Avenue South
Vancouver, BC Canada V5X4N6

Telephone:

604-326-6643

Fax:

n/a

Contact person: Torr Brown

Order No: n/a

Order Date: n/a

TESTING AUTHORITY

NOVITA CHILDREN'S SERVICES - NOVITATECH TEST LABORATORY

171 Days Road., Regency Park, South Australia, 5010

Telephone: (08) 8243 8289

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Testing supervisor: Wayne Wurfel

Senior Test Technician
(NATA signatory)

Ambient test temperature:

21 °C

Checked: Craig Barber

(Test Technician)

Date of review

November 2012

Date of issue of this review:

6th November 2012



PRODUCT DETAILS

Manufacturer:

Name Product Design Group
 Address Unit 103-318 East Kent Avenue South, Vancouver, BC, Canada V5X4N6

Chair type:

Frame:

Size Adult
 Frame Rigid frame, tilting
 Tilt Yes
 Recline No
 Anti-tips Yes
 Push handles Single bar type
 Footrests Individual, lift out
 Armrests Height adjustable, removable
 Headrest No

Seating:

Backrest
 Width 410 mm
 Height 552 mm
 Description Sling type fabric backrest
 Seat
 Width 595 mm
 Depth 475 mm
 Description Metal base with removable padded cushion

Wheels:

Castor	Front	Rear
Width	50 mm	n/a
Diameter	150 mm	n/a
Description	Pneumatic tyres	n/a
Drive Wheel		
Width	40 mm	
Diameter	600 mm	
Description	Pneumatic tyres	

Other features: Tilt function

Set-up details (to AS3696.22) To AS3695.22 requirements
 (No castor wheel or drive wheel adjustments available)

Note: Other descriptive dimensions etc. may be included in part 5 and 7 of the test report



Clause in ISO 7176-1:1999	Test Requirement	Result of Verification
Wheelchairs - Static stability		
Depending on the direction of tip, wheelchairs can tip about the point of contact with the ground when the wheels are locked with respect to the frame or about the wheel axle when the wheel locks are not applied. The angle of slope on which the wheelchair will tip about the most unstable axis is measured on a test plane with an adjustable slope by increasing the angle of the test plane until the tipping angle is reached.		
2.1	Test for static stability in the forward direction	
a)	For wheelchairs without lockable front wheels, as specified in 2.1.1 & 2.1.3 only	NA
b)	For wheelchairs with lockable front wheels, as specified in 2.1.1 to 2.1.4	Pass
	Adjustable wheelchair component	Least stable Most stable
-	Rear wheel position, fore-aft	Forward Back
-	Castor attachment to frame, fore-aft	Back Forward
-	Seat position, fore-aft	Forward Back
-	Seat position, vertical	High Low
-	Seat-back position, fore-aft	Forward Back
-	Seat back position, recline	Upright Back
-	Seat position, tilt	Upright Back
-	Elevating leg rest position	Up Down
2.1.1	Wheels unlocked and the wheelchair in the least stable configuration	Pass
2.1.2	Wheels locked and the wheelchair in the least stable configuration	Pass
2.1.3	Wheels unlocked and the wheelchair in the most stable configuration	Pass
2.1.4	Wheels locked and the wheelchair in the most stable configuration	Pass
2.2	Test for static stability in the rearward direction	
a)	For wheelchairs without lockable rear wheels, as specified in 2.2.1 & 2.2.3 only	NA
b)	For wheelchairs with lockable rear wheels, as specified in 2.2.1 & 2.2.4	Pass
	Adjustable wheelchair component	Least stable Most stable
-	Rear wheel position, fore-aft	Forward Back
-	Castor attachment to frame, fore-aft	Back Forward
-	Seat position, fore-aft	Back Forward
-	Seat position, vertical	High Low
-	Seat back position, recline	Back Upright
-	Seat position, tilt	Back Upright
-	Seat back position, fore-aft	Back Forward
2.2.1	Wheels unlocked and the wheelchair in the least stable configuration	Pass
2.2.2	Wheels locked and the wheelchair in the least stable configuration	Pass
2.2.3	Wheels unlocked and the wheelchair in the most stable configuration	Pass
2.2.4	Wheels locked and the wheelchair in the most stable configuration	Pass
2.3	Test for rearward static stability with rear anti-tip devices	
2.3.1	Anti-tip device in the least stable configuration	Pass
2.3.2	Anti-tip device in the most stable configuration	Pass

Clause in ISO 7176-1:1999		Test Requirement			Result of Verification
2.4		Test for static stability in the sideways direction			
Adjustable wheelchair component		Least stable		Most stable	
- Rear wheel position, camber		Narrowest track		Widest track	
- Castor attachment to frame, fore-aft		Back		Forward	
- Castor attachment to frame, inside-outside		Inside		Outside	
- Seat position, fore-aft		Forward		Back	
- Seat position, vertical		High		Low	
- Seat position, tilt		Upright		Back	
- Seat back position, recline		Upright		Back	
2.4.1	Wheelchair in the least stable configuration				Pass
2.4.2	Wheelchair in the most stable configuration				Pass
3.		Results			
			Least stable	Most stable	
	Forward	Front wheels locked	>15°	>15°	
		Front wheels unlocked	>15°	>15°	
	Rear	Rear wheels locked	>15°	>15°	
		Rear wheels unlocked	>8.5°	>12.2°	
		Anti-tip devices*	>10°	>10°	
	Sideways	Left	>10°	>10°	
		Right	>10°	>10°	
*“Least stable” & “Most stable” refer to the positioning of the anti-tip devices					
ISO 7176-3:2003 Wheelchairs – Determination of effectiveness of brakes.					
A number of wheelchair braking operations are carried out and the resulting responses of the wheelchair are measured and observed.					
2.1	Parking brakes				Pass
2.2	Running brakes, normal operation				NA
2.3	Running brakes, operation by reverse command				NA
2.4	Running brakes, emergency operation				NA
2.5	Parking brakes fatigue.				Pass
3.		Test results			
3.1		For manual chairs:			
	Requirement	Facing downhill	Facing uphill		
	Angle of the plane when movement commences	12°	15°	Pass	
	The type of movement	Sliding	Tipping commences	Pass	
	Brakes fatigue (60,000 cycles)	60, 000 cycles		Pass	

Clause in ISO 7176-1:1999	Test Requirement					Result of Verification
3.2	For electrically powered wheelchairs:					
Test plane angle	Direction of travel	Result	Normal operation	Reverse command	Emergency power off	Comments
0°	Forwards	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
0°	Reverse	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
3°	Forwards downhill	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
3°	Reverse downhill	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
6°	Forwards downhill	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
6°	Reverse downhill	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
9°	Forwards downhill	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a
9°	Reverse downhill	Min braking dist, M Max speed, m/s	n/a	n/a	n/a	n/a

ISO 7176-5:2008 Wheelchairs – Determination of dimensions, mass & manoeuvring space

1.	Wheelchair classes and occupant mass groups		
	Classes of electrically powered wheelchairs:	Group 1	Not be electrically powered wheelchairs
	Occupant mass groups:	Group II	A mass between 50 kg and 125 kg
2.	Measurement of dimensions:		
#	Measurement position / component		Record (mm)
1)	Full overall length		1150 mm
2)	Overall width		720 mm
3)	Handgrip height		Not measured
4)	Stowage length		980 mm
5)	Stowage width		720 mm
6)	Stowage height		1100 mm
7)	Rising		n/a
8)	Total mass		33.4 kg
9)	Mass of heaviest part		n/a
10)	Pivot width		850 mm
11)	Reversing width		Not measured
12)	Turning diameter		1235 mm
13)	Ground clearance		Not measured
14)	Required width of angled corridor		Not measured
15)	Required doorway entry depth		Not measured
16)	Required corridor width for side opening		Not measured

ISO 7176-7:1998 Wheelchairs – Determination of seating and wheel dimensions

An RLG is positioned in the wheelchair seat so as to provide repeatable deformation of the wheelchair and seat structure. Measurements of seating and wheelchair dimensions are made to reference points and planes on the RLG (Reference loader gauge)

2.	Measurement procedure:			
2.1	Selection of correct RLG size (Adult or child)			
2.2	Positioning of the RLG			
2.3	Recording of measurements			
3.	Result of measurements			
#	Dimension	Fixed or min. value	Maximum value	N° of increments
1)	Seat plane angle	1.5°	34.0°	Infinite
2)	Effective seat depth	475 mm	475 mm	n/a
3)	Seat width	595 mm	595 mm	n/a
4)	Effective seat width	595 mm	595 mm	n/a
5)	Seat surface height, front edge	455 mm	Not measured	n/a
6)	Backrest angle	10.0°	42.5°	Infinite
7)	Backrest height	552 mm	552 mm	n/a
8)	Backrest width	410 mm	410 mm	n/a
9)	Headrest in front of backrest	n/a	n/a	n/a
10)	Headrest height above seat	n/a	n/a	n/a
11)	Footrest to seat	Not measured	n/a	n/a
12)	Footrest clearance	Not measured	n/a	n/a
13)	Footrest length	Not measured	n/a	n/a
14)	Footrest to leg angle	Not measured	n/a	n/a
15)	Leg to seat surface angle	Not measured	n/a	n/a
16)	Armrest height	Not measured	n/a	n/a
17)	Front of armrest to backrest	Not measured	n/a	n/a
18)	Armrest length	Not measured	n/a	n/a
19)	Armrest width	Not measured	n/a	n/a
20)	Armrest angle	Not measured	n/a	n/a
21)	Distance between armrests	Not measured	n/a	n/a
22)	Front location of armrest structure	Not measured	n/a	n/a
23)	Hand-rim diameter	25 mm	25 mm	n/a
24)	Propelling wheel diameter	600 mm	600 mm	n/a
25)	Horizontal displacement of wheel axle	Not measured	n/a	n/a
26)	Vertical displacement of wheel axle	Not measured	n/a	n/a
27)	Castor wheel diameter	150 mm	150 mm	n/a

ISO 7176-8:1998 Wheelchairs – Requirements and test methods for static, impact & fatigue strengths

1. Static strength tests:				
Test position		Force applied	Remarks	
Armrests	Downward	760 N	None	Pass
	Upward	1000 N	None	Pass
Footrests	Downward	1000 N	None	Pass
	Upwards (each)	440 N	None	Pass
	Upwards (single)	NA	NA	NA
Tipping levers		NA	NA	NA
Handgrips		750 N	None	Pass
Push handles	Each (single)	1760 N	None	Pass
	Bar type	NA	NA	NA
2 Impact strength tests				
Test position		Test condition	Remarks	Result
Backrest		25kg pendulum, 30°, two applications	None	Pass
Hand-rim		10kg pendulum, 45°, two applications	None	Pass
Castor		10kg pendulum, 45°, two applications	None	Pass
Footrests	Lateral	10kg pendulum, 45°, two applications	None	Pass
	Longitudinal	10kg pendulum, 45°, two applications	None	Pass
Front structure	Frontal	10kg pendulum, 45°, two applications	NA	NA
	Offset	10kg pendulum, 45°, two applications	NA	NA
3 Two-drum fatigue test				
Test condition		Remarks	Result	
Speed: 1.0 metre / sec		As per specification	Pass	
200,000 cycles		200,000 cycles		
4 Kerb drop fatigue test				
Test condition		Remarks	Result	
Height of drop: 50 mm		As per specification, all 4 wheels	Pass	
6,666 cycles		6,666 cycles		

ISO 7176-22: 2000 Wheelchairs – Set-up procedures

1.	Adjusting the wheelchair		
	Adjustable parameter	Type of equipment	Value / position / measurement
	Air pressure in pneumatic tyres and drive wheels	TLE067	As per marking
	Air pressure in pneumatic tyres, castors	TLE067	As per marking
	Distance between the brake blocks & their contact surfaces	TLE77	55 N Engaged
	Drive wheel axle position, horizontal	n/a	n/a
	Drive wheel axle position, vertical	n/a	n/a
	Drive wheel camber	TLE148	90°
	Drive wheel track width	TLE084	Not measured
	Castor stem housing position, horizontal	n/a	Fixed
	Castor stem housing position, vertical	n/a	Fixed
	Castor wheel axle position, vertical	TLE148	Fixed
	Castor wheel track width	TLE084	Not measured
	Castor stem angle, fore-aft plane	TLE148	Fixed
	Castor stem angle, lateral plane	TLE148	Fixed
	Seat depth	n/a	475 mm
	Backrest height	n/a	552 mm
	Seat plane angle	Inclinometer	1.5°
	Backrest angle	Inclinometer	10°
	Leg to seat surface angle	Inclinometer	Not measured
	Footrest angle	TLE148	Not measured
	Footrest clearance	TLE084	Not measured
	Control device, mounting	n/a	n/a
	Control device, electrical settings	n/a	n/a
	Other electrical control devices	n/a	n/a
	Footrest height	n/a	50 mm
2.	Final adjustments		
	Adjustable parameter	Type of equipment	Value / position / measurement
	Backrest angle	Inclinometer	10.0°
	Seat plane angle	Inclinometer	1.5°
	Castor stem angle	TLE 148	90°
	Distance between the brake blocks & their contact surfaces	TLE77	55 N Engaged
3.	Test dummy set-up		
	Adjustable parameter	Type of equipment	Value / position / measurement
	Calculated seat to back angle	Inclinometer	mm
	Dummy size	TLE133	Adult, 100 kg
	Dummy seat to back angle	TLE148	8.5°

ISO 7176-15:1996 Requirements for information disclosure, documentation and labelling.		
Clause	Requirement	Result
5.	Requirements for disclosure of test information in manufacturer's specification sheets.	
	Specification sheet must contain the following:	
a)	The model designation and/or any other information that will uniquely identify the wheelchair model	Pass
b)	The mass of the test dummy used in the test	Pass
c)	Either: i) the performance values listed in Annex A, in the order and using the wording shown	Pass
	Or: ii) if the part of ISO 7176 specifies a method of disclosure, that method shall have precedence over i)	NA
d)	Maximum occupant mass	Pass
6.	Test report	
	Are performance values resulting from the testing of a specific model of wheelchair to parts of ISO 7176 disclosed as specified in the relevant part of ISO 7176?	Pass
7.	Documentation	
	General:	
7.1	Is the following information available in the official language of the countries in which the wheelchair is marketed?	
a)	The specification sheets	Pass
b)	A statement as to which features and options are included in specific models	Pass
c)	A description of the intended user (eg mass, indoor / outdoor use etc.)	Pass
d)	Either: i) details of warranty	Pass
	Or: ii) If no warranty is provided, a statement to that effect	NA
e)	Information on how to get repairs and service	Pass
f)	Information as to whether a service manual is available	Pass
g)	A user manual	Pass
7.2	User manual:	
	At least 1 copy of the users' manual to be supplied with the wheelchair	Pass
	Where illustrations are used:	
	- Components numbered or named for positive identification	Pass
	- Illustrations numbered or named for positive identification	Pass
7.3	Contents of user manual	
	User manual to contain the following information:	
a)	Details of the warranty as specified in 7.1d	Pass
b)	General characteristics as follows:	
b) i)	Description of the wheelchair type, accompanied by pictures or drawings of the wheelchair & a non-technical description of how the chair is intended to be used	Pass
b) ii)	Description of the intended user, including maximum occupant mass	Pass
b) iii)	The environment in which the wheelchair is intended to be used and any other environmental conditions that might be harmful to the wheelchair, such as temperature and humidity	Pass
b) iv)	If pneumatic tyres are fitted, the recommended inflation pressure or range in kPa	Pass
c)	If the wheelchair is marketed for user assembly, shall contain the following information:	
c) i)	A list of components	Pass
c) ii)	Information about tools or equipment needed to assemble the wheelchair	Pass
c) iii)	Instructions on how to inspect for missing or damaged parts	Pass

Clause	Requirement	Result
c) iv)	Instructions for assembly, installation or removal of any parts supplied by the manufacturer	Pass
c) v)	Instructions on how to prepare the wheelchair for storage, shipment or travel	Pass
d)	Instructions for operation of the wheelchair as follows.	
	Complete operating instructions for safe use including:	
d) i)	- Instructions for operating the wheelchair on surfaces likely to be encountered by the user	Pass
	- Instructions for transfer of the user to and from the wheelchair	Pass
	- Illustrations to clarify these instructions	Pass
d) ii)	Any common misuse of the wheelchair known by the manufacturer that might lead to personal injury or damage to the wheelchair.	Pass
e) i)	Maintenance instructions accompanied by annotated illustrations and the following:	
	- Any service, maintenance &/or fault -finding for which the manufacturer intends the user to be responsible for.	Pass
	- Information about the types of tools or equip needed for repair and servicing	Pass
	- Frequency of maintenance	Pass
	- A list of materials necessary, including part numbers and procurement information	Pass
	- Identification of circumstances in which an operation should be undertaken by the manufacturer, distributor or service agent	Pass
e) ii)	Instructions and methods of cleaning	Pass
e) iii)	For parts that the manufacturer intends to be readily replaced, the following:	
	- order information	Pass
	- Instructions for access removal	Pass
	- replacement and testing	Pass
	- Annotated illustrations of the parts (including tyres & batteries) & their locations	Pass
e) iv)	Information on how to perform potentially hazardous maintenance operations, such as battery servicing and tyre inflation	Pass
f)	Instructions for carrying out performance checks	NA
g)	Description of wheelchair repair procedures as follows:	
g) i)	Identification of parts that are intended to be repaired by the user	Pass
g) ii)	Identification of parts that have to be serviced by the manufacturer or an authorised service facility in order to maintain any warranties and serviceability	Pass
g) iii)	Identification of any parts that can be removed and sent to the manufacturer / distributor or other party for repair.	Pass
g) iv)	Identification of circumstances in which the manufacturer, distributor or service agent should undertake the repair	Pass
g) v)	A list of authorised service facilities	Pass
g) vi)	Information on whether or not any replacement units are available	Pass
g) vii)	Packing and shipping instructions where necessary	Pass
8.	Permanent labelling	
8.1	The following information to be marked in a permanent manner on the wheelchair:	
a)	The name and address of the manufacturer	Pass
b)	The model designation and serial number	Pass
c)	The year of manufacture	Pass
d)	Any driving restrictions	Pass
e)	Recommended maximum user mass	Pass
8.2	Tyres to be marked with size	Pass

ISO 8191-1:1987 Assessment of the ignitability of upholstered furniture

Ignition source: Smouldering cigarette

10.3 Final examination

10.3.1 Measuring		Result of test:				Not assessed
Object	Ignition Time	I* or NI*	Measured dimensions of damaged area			Comments
			Length (mm)	Width (mm)	Depth (mm)	
Seat	2.5 min	-	-	-	-	Not assessed
Seat	30 min	-	-	-	-	Not assessed
Back	2.5 min	-	-	-	-	Not assessed
Back	30 min	-	-	-	-	Not assessed
10.3.2 Progressive smouldering		Result of test:				Not assessed

Remarks:

Report # 3072852 From Intertek ETL SEMKO, confirmation of cushion & back materials and foam tested to requirements of State of California Technical Bulletin 117 Section D. Result: Passed.
 WW. End of remarks -----

*I = Ignition *NI = Non ignition

ISO 7176-15 INFORMATION DISCLOSURE

Feature	Min	Max	Feature	Min	Max
Overall length with legrest	980 mm	1150 mm	Seat plane angle	1.5°	34.0°
Overall width	720 mm	720 mm	Effective seat depth	475 mm	475 mm
Folded length	n/a	n/a	Effective seat width	595 mm	595 mm
Folded width	n/a	n/a	Seat surface height at front edge	455 mm	n/a
Folded height	n/a	n/a	Backrest angle	10.0°	42.5°
Total mass	33.4 kg	33.4 kg	Backrest height	552 mm	552 mm
Mass of heaviest part	n/a	n/a	Footrest to seat distance	n/s	n/s
Static stability downhill	n/s	n/s	Leg to seat angle	n/s	n/s
Static stability uphill	n/s	n/s	Armrest to seat distance	n/s	n/s
Static stability sideways	n/a	n/a	Front location of armrest structure	n/s	n/s
Energy consumption	n/a	n/a	Hand-rim diameter	n/s	n/s
Dynamic stability uphill	n/a	n/a	Horizontal location of axle	n/s	n/s
Obstacle climbing	n/a	n/a	Minimum turning radius	n/s	n/s
Minimum braking distance from max speed	n/a	n/a	Maximum speed forward	n/a	n/a

Remarks:

Information disclosure: Results marked n/s refer to values not included in owners /operators manual.
WW. End of remarks -----

The sample submitted for this test satisfies the relevant requirements of ISO 7176 -1, 3, 5, 7, 8, 15, 16 & 22 Wheelchairs (except the methods indicated in this report as “not tested” and/or tested with deviations).

Yes

NOTES

- 1 U₉₅ Uncertainty of measurements where not specified: linear ±1mm, angular ± 30', force, mass ±1%, temperature ±1°C, cycles ±1 count. This means the true measurement is within the stated tolerances at least ninety five times in one hundred
- 2 All testing was carried out in a controlled environment laboratory using methods set out in the Standards documents, all deviations and additions to the Standards' methods are noted in remarks.
- 3 All instruments either carried valid calibration certificates throughout the test period or were checked against traceable Standards before and after use.
- 4 The NovitaTech Test Laboratory has no control over the selection of test samples. Any extension of the findings of this report to cover production items must be based on production being truly represented by the sample(s).
- 5 Any non-conformances are indicated in red.

END OF REPORT