

TEST REPORT FOR:
Product Design Group Inc.
Dory tilting manual wheelchair, 114 kg / 250 lbs



LABORATORY REFERENCE

492619-3

This report supersedes report # 492619-2 dated 17th May 2017

24th May 2017

REFERENCED DOCUMENTS IN THIS REPORT:

AS/NZS 3695.1:2011	
Part 1: Requirements and test methods for manual wheelchairs	
Part 1	AS/NZS ISO 7176.1:2015 (Identical to ISO 7176-1:2014) Part 1: Determination of static stability
Part 3	AS/NZS ISO 7176.3:2015 (Identical to ISO 7176-3:2012) Part 3: Determination of effectiveness of brakes
Part 5	AS 3696.5-1989 (Identical to ISO 7176/5:1986, Reconfirmed 2014) Part 5: Determination of overall dimensions, mass and turning space
	ISO 7176-5:2008 Wheelchairs – Part 5: Determination of dimensions, mass and manoeuvring space
Part 7	ISO 7176-7-1998 (E) Part 7: Measurement of seating and wheel dimensions
Part 8	AS/NZS ISO 7176.8:2015 (Identical to ISO 7176-8:2014) Part 8: Requirements & test methods for static, impact and fatigue strengths
Part 11	AS/NZS ISO 7176.11:2013 (Identical to ISO 7176-11:2012) Part 11: Test dummies
Part 13	AS 3696.13-1991 (Identical to ISO 7176-13:1989) Part 13: Coefficient of friction of test surfaces
Part 16	AS/NZS ISO 7176.16:2013 (Identical to ISO 7176-16:2012) Part 16: Resistance to ignition of postural supports
Part 19	AS/NZS 3696.19:2009 (Adopted from ISO 7176-19:2008 MOD) Part 19: Wheeled mobility devices for use as seats in motor vehicles
Part 22	AS/NZS ISO 7176.22:2015 (Identical to ISO 7176-22:2014) Part 22: Set-up procedures
Part 26	AS/NZS ISO 7176.26:2011 (Identical to ISO 7176-26:2007) Part 26: Vocabulary

The above referenced standards were confirmed as current at date of testing

TEST REPORT

This report may NOT be reproduced in part without written laboratory authorisation. 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 the production being truly represented by the sample(s).

PRODUCT

Job no: 492619-3

Name and Model No:

Product Design Group Inc.
Dory tilting manual wheelchair

Serial no(s) of test sample:

No marking on sample (Pre-production)

Maximum user mass:

114 kg / 250 lbs

Documents used in testing

As referenced on page 2 of this report.

SUPPLIER

Name:

Product Design Group Inc.

Address:

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



Telephone: +1 604 323 9220

Fax: n/a

Contact person: Torr Brown

Order No: n/a

Order Date: n/a

TESTING AUTHORITY

NOVITATECH TEST LABORATORY
171 Days Road, Regency Park, South Australia, 5010

Telephone: 1300 85 55 85

Fax: (08) 8243 8208

Testing supervisor: Wayne Wurfel

Senior Test Technician
(Authorised signatory)

Checked: Andrew Rose

(Team Leader)

Dates of testing period:

October, November 2016

Date of issue of this report:

24th May 2017

PRODUCT DETAILS

Manufacturer:

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

Chair type:

Manual wheelchair with tilt function

Frame:

Size Adult chair
Frame type Rigid frame with tilting seat function
Frame material Tubular steel construction
Tilt Yes
Recline Yes
Anti-tips Anti-tips fitted
Push handles Single 1 piece bar type push handle
Footrests Individual footrests, swing-away, removable
Armrests Height adjustable, lift out, padded armrests
Headrest No headrest fitted
Brakes Manual hand operation, L & R sides of frame, operating against rear wheels.

Seating:

Backrest
Width 450 mm
Height 500 mm
Description Sling type fabric backrest
Seat
Width 450 mm
Depth 500 mm
Description Solid metal base

Wheels:

Castor Front
Width 30 mm
Diameter 200 mm
Description Plastic rims with solid tyres
Drive Wheel
Width 32 mm
Diameter 600 mm
Description Plastic rims, metal hand-rim, solid tyres

Other features or additional equipment

Tie down brackets fitted to sample
No additional equipment fitted to wheelchair unless specifically noted

Set-up details (to AS3696.22)

Ambient test temperature: 20° C (Unless stated otherwise in report)
As per user instructions and test standards requirements

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

**Record of measurements from Set-up procedures to AS/NZS ISO 7176.22:2015 (ISO 7176-22:2014)
Table B.2 (Informative requirements)**

Adjustable part	Type of Equipment	Value / Position Measurement
Seat plane angle	TLE 185 Inclinator	4.0°
Effective seat depth	TLE 141 measure	525 mm
Effective seat width	TLE 141 measure	455 mm
Seat surface height at front edge	TLE 141 measure	485 mm (@ 4.0°)
Back support angle	TLE 185 Inclinator	11.4°
Back support height	TLE 141 measure	480 mm
Handgrip height	TLE 141 measure	1035 mm
Back support width	TLE 141 measure	450 mm
EITHER Footrest to seat Or Foot support clearance	TLE 141 measure	435 mm
	TLE 141 measure	50 mm
Foot support length	TLE 141 measure	150 mm
Foot support to leg angle	TLE 185 Inclinator	90°
Leg to seat surface angle	TLE 185 Inclinator	97°
Arm support height	TLE 141 measure	255 mm
Front of arm support to back support	TLE 141 measure	365 mm
Air pressure, drive wheels	TLE 067	NA (Solid tyres)
Air pressure, castor wheels	TLE 067	NA (Solid tyres)
Fixed (rear) wheels diameter	TLE 141 measure	600 mm
Fixed (rear) wheels, camber	TLE 185 Inclinator	0°
Fixed (rear) wheels, track	TLE 141 measure	625 mm
Fixed (rear) wheels, air pressure	TLE 067 measure	NA (Solid tyres)
Movable (castor) wheels diameter	TLE 141 measure	200 mm
Movable (castor) wheels, camber	TLE 185 measure	0°
Movable (castor) wheels, track	TLE 141 measure	580 mm
Movable (castor) wheels, air pressure	TLE 067 measure	NA (Solid tyres)
Other adjustable components	No other adjustable components	

Note: NA referenced for items that are not adjustable or applicable to this wheelchair.

AS/NZS 3695.1:2011 – GENERAL REQUIREMENTS

Requirements	Result of verification	Reference in AS EN 12182
Section 5 – General requirements		
Corrosion – Risk assessment in accordance with Clause 4.1 of AS EN 12182	By manufacturer	Clause 4.1
Shall conform to the requirements of AS EN 12182-2002 (with reference to AS/NZS 4810.1)		
(a) Intended performance and technical documentation	PASS	Clause 4.2
(b) Aids that can be dismantled	NA	Clause 4.4
(c) Single use fasteners	NA (None)	Clause 4.5
(d) Biocompatibility and toxicity	By manufacturer	Clause 5.2
(e) Contaminants and residues	By manufacturer	Clause 5.3
(f) Infection and microbiological contamination	By manufacturer	Clause 5.4
(g) Overflow, spillage, leakage and ingress of liquids	NA	Clause 9
(h) Safety of moving parts	PASS	Clause 12
(i) Prevention of traps for parts of human body	PASS	Clause 13
(j) Folding and adjusting mechanisms	PASS	Clause 14
(k) Surfaces, corners and edges	PASS	Clause 18
Requirements	Result of verification	Reference in AS3695.1:2011
Risk analysis by manufacturer, in accordance with AS/NZS 4810.1	By supplier	5.1
Section 6 – Design and construction requirements		
Pneumatic tyres		
- Same type of valve connection for all tyres, Maximum pressure marked	NA (Solid)	6.1
Fitting of anterior pelvic support		
- Shall have provision for anterior pelvic support to be fitted	PASS	6.2
Wheelchairs for use as seats in motor vehicles		
- If occupant mass >22 kg, shall conform to AS/NZS 3696.19	See remarks	6.3
- If occupant mass <22 kg, shall conform to AS/NZS 3696.19:2009	NA	
Foot supports, lower leg supports and arm supports		
- Shall be fitted with foot supports	PASS	6.4
- Provision for preventing occupants feet from sliding backwards	See remarks	
Brake system		
- Shall have provision to be fitted with a brake system	PASS	6.5
Component mass		
- Components >10 kg provided with suitable handling device	NA	6.6
Operations intended to be carried out by operator		
- All controls to meet requirements of Clause 7.1 (a, b), Appendix A & Clause 8	NA	6.7

AS/NZS 3695.1:2011 – PERFORMANCE REQUIREMENTS

Requirements	Result of verification	Reference in AS3695.1:2011
Section 7 – Brake system		
- Shall be accessible and operable by the operator	PASS	7.1 (a)
- Maximum operating forces (as per Table 1, AS/NZS ISO 7176.3:2015)	PASS	7.1 (b)
- No parts above level of occupied seat (With removable or movable arm supports)	PASS	7.1 (c)
- Provision for adjustment or replacement	PASS	7.1 (d)
- Shall not slide or rotate on slope of < 7° (when tested to AS/NZS ISO 7176.3:2015)	PASS	7.1 (e)
- No movement away from pre-set condition after completion of all brake testing	PASS	7.1 (f)
- Shall not roll on slope of 7° after Static, Impact and Fatigue tests	PASS	7.1 (g)
Section 7.2 Static, Impact and Fatigue strength		
- After completion of all tests, shall conform to requirements of AS/NZS 3696.8	PASS	7.2
Section 7.3 – Static stability		
- If rearward stability <10° then must be fitted with anti-tip devices	NA	7.3
- If fitted with anti-tip devices, must be stable at >10° for rearward stability	PASS	
Section 7.4 – Operating force		
- Max forces for engage & release, ref: Table 1, AS/NZS ISO 7176.3:2015 (60N)	PASS	7.4
- If knob diameter >25 mm, maximum torque to be applied = Knob dia x 0.05 (Nm)	NA	7.4 (a)
- If knob diameter <25 mm, maximum torque to be applied = Knob dia x 0.025 (Nm)		7.4 (b)
Section 7.5 – Pushing force		
- Force required to start & keep moving a wheelchair with user mass <100kg, 40 N	NA	7.5.1 (a)
- With user mass >100 kg and <150 kg, 60 N	PASS (32 N)	7.5.1 (b)
- With user mass >150 kg and <200 kg, 70 N	NA	7.5.1 (c)
Section 7.6 – Foot supports & lower leg supports		
- Incorporate means to fix securely in any operating position	PASS	7.6.1 (a)
- Lower leg support height adjustments in increments <25 mm	PASS	7.6.1 (b)
- Movable to facilitate transfer without use of tools	PASS	7.6.1 (c)
- Foot support gap as per AS EN 12182-2002 Clause 13 (<35 or >100 mm)	PASS	7.6.1 (d) (i)
- Fitted with means to prevent occupant's feet sliding into gap		7.6.1 (d) (ii)
Section 7.7 Arm supports		
- Shall incorporate means to be suitable for loading in any operating position	PASS	7.7 (a)
- Be movable to facilitate transfer without tools	PASS	7.7 (b)

AS/NZS 3695.1:2011 – PERFORMANCE REQUIREMENTS (Cont.)

Requirements	Result of verification	Reference in AS3695.1:2011
7.8 Push handles and grips		
- Complies with requirement of Figure 1 (85° from rear of push handle)	PASS	7.8 (a)
- Complies with requirement of Figure 1 (2 planes not < 350mm apart)	PASS	7.8 (b)
- Complies with requirement of Figure 1 (Horizontal test plane)	PASS	7.8 (c)
- Handgrips (where fitted) at least 75 mm long	PASS	7.8
- Handgrips width (where fitted) >20 mm, <45 mm	PASS (32 mm)	7.8
- Handgrip width (where fitted with controls) not > 75mm before force applied	PASS	Fig 2
7.9 Resistance to ignition (As per ISO 7176-16)		
- All postural support devices	See remarks	7.9 (a)
- Complete composite of all upholstered parts	See remarks	7.9 (b)
- The material of each part of foam materials	See remarks	7.9 (c)
7.10 Seating adjustments for tilt and recline systems		
- Controls operated by occupant shall be accessible from all seating positions	NA	
7.11 Castor stem (As per ISO 7176-5)		
- Fore-aft castor stem angle shall be 90° (+2°, -0°)	PASS	7.11 (a)
- Difference between left & right castor not > 1°	PASS	
- Lateral castor stem angle to be 90° (+/- 1°)	PASS	7.11 (b)
- Asymmetry between left & right castor not >1°	PASS	
- If rear wheels or castors adjustable, then castor stem angle adjustable to 90° (+2°/-0°)	PASS	7.11 (c)

Remarks:

Clause 7.9 a), b), c) Resistance to ignition was not assessed by this laboratory. Labels on the upholstery state that the materials used meet the requirements of the California Bureau of Home Furnishings Bulletin 117. A separate report/s should be available from the manufacture on request.

Clause 6.4 There were no heel or calf straps fitted to the footrests of the sample supplied for testing. These may be available as an option and are required for compliance to the referenced standards in this report.

The sample supplied for testing was fitted with the optional Transit Tie-Down System (TTDS) The operator manual states that when fitted with the TTDS system the product has been dynamically tested in a forward facing mode to a 30 mph frontal impact test.

The designated tie-down anchorage points fitted have been identified with the recognised carabiner symbols, and no further marking is required for compliance to AS/NZS 3695.1:2011.

If this wheelchair is not intended for use as a seat in motor vehicles and does not have the TTDS option fitted, the product must be labelled as specified below:

- Clauses, 8.2 (d) (ii) For AS/NZS 3696.19 Non-compliant chairs, warning label with the words 'Not AS/NZS 3696.19 compliant'
- Clause 8.2 (d)(ii) A,B,C Label to have correct font size, contrast & location on chair
- Clause 8.2 (e) (i, ii,iii) Label/s to be permanent and durable

WW. End of remarks -----

AS/NZS 3695.1:2011 – INFORMATION DISCLOSURE REQUIREMENTS

Requirements	Result of verification	Reference in AS3695.1:2011
8.1 General		
- Documentation and labelling available in English	PASS	
- Manufacturer to provide full test report when requested	PASS	
Printed documentation to comprise the following:		
- Contact name, phone number & email address of sponsor in country of supply	PASS	8.1 (a)
- Details of how to obtain documentation of this clause	PASS	8.1 (b)
- Operator information (in printed or CD/DVD format)	PASS	8.1 (c)
8.2 Labelling - Permanent & durable labels for the following:		
- Make	PASS	8.2 (a) (i)
- Model	PASS	8.2 (a) (ii)
- Safe working load (in kg)	PASS	8.2 (a) (iii)
- Year of production	See remarks	8.2 (a) (iv)
- Unique identification number	See remarks	8.2 (a) (v)
- Contact details & name and address of manufacturer	PASS	8.2 (b)
- Identification of engagement / disengagement systems including warnings	NA	8.2 (c)
- For AS/NZS 3696.19 compliant chairs, WTORS approved symbol attached	See remarks	8.2 (d) (i)
- For AS/NZS 3696.19 Non-compliant chairs, warning label attached	See remarks	8.2 (d) (ii)
- Label to have correct font size, contrast & location on chair	See remarks	8.2 (d)(ii) A,B,C
- Label/s to be permanent and durable	See remarks	8.2 (e) (i, ii,iii)
8.3 Pre-sale information – to include the following:		
- Description of the intended occupant of the wheelchair (including specific requirements)	PASS	8.3 (a)
- Description of intended use and intended environment	PASS	8.3 (b)
- Overall dimensions (mm), Mass (kg), ready for use and folded (Appendix B)	PASS	8.3 (c)
- Standard options available	PASS	8.3 (d)
- Types of tyres that can be used	PASS	8.3 (e)
- Operator adjustments	PASS	8.3 (f)
- Whether & how wheelchair can be folded or dismantled for storage or transport	PASS	8.3 (g)
- Heaviest part of wheelchair (if capable of dismantling)	NA	8.3 (h)
- Instructions for transport when not occupied	PASS	8.3 (i)
- Information if intended for use as a seat in vehicle and effect on options	PASS	8.3 (j)
- If intended as seat in vehicle, details of attachment points and accessories & warnings	PASS	8.3 (k)
- Specific information on Australian / New Zealand warranties & contact details	See remarks	8.3 (l)

AS/NZS 3695.1:2011 – INFORMATION DISCLOSURE REQUIREMENTS (Cont.)

Requirements	Result of verification	Reference in AS3695.1:2011
8.4 Operator information – Shall contain the following:		
- Location of unique identification number	PASS	8.4 (a)
- Information relating to the supplied chair from Clause 8.3 (a), (d) , (i) to (k)	PASS	8.4 (b)
- Intended operator (occupant, assistant or both)	PASS	8.4 (c)
- Adjustments or settings required before use & warnings for effects on stability	PASS	8.4 (d)
- Information on adjustments and persons competent for adjustments	PASS	8.4 (e)
- Instructions for operation of all controls, including brakes	PASS	8.4 (f)
- Manufacturers recommended tyres and tubes	PASS	8.4 (g)
- Manufacturers recommended maintenance requirements	PASS	8.4 (h)
- Warning regarding surface temperatures of wheelchair	See remarks	8.4 (i)
- Warning for trapping hazards & pinch points	PASS	8.4 (j)
- Instructions of drive engagement & disengagement	NA	8.4 (k)
- Instructions for dismantling and re-assembly of wheelchair	NA	8.4 (l)
- Mass of heaviest component of wheelchair (in kg)	NA	8.4 (m)
- Areas of safe handling, moving, dismantling, assembly, carrying etc.	PASS	8.4 (n)
- Information on recycling	See remarks	8.4 (o)
- Warnings if adjustments can be set outside safe limits	NA	8.4 (p)
- Information on Australian / New Zealand warranty & contacts for service & repairs	See remarks	8.4 (q)

Remarks:

Clause 8.2 (a) (iv)
 Year of production may be coded as part of the serial number.
 Clauses 8.3 (l), 8.4 (i), 8.4 (o)
 Only required if this product is to be sold into Australian / New Zealand.
 Clauses 8.2 (d) & (e)
 The sample supplied for testing was fitted with the optional Transit Tie-Down System (TTDS)
 The operator manual states that when fitted with the TTDS system the product has been dynamically tested in a forward facing mode to a 30 mph frontal impact test.
 The designated tie-down anchorage points fitted have been identified with the recognised carabiner symbols, and no further marking is required for compliance to AS/NZS 3695.1:2011.
 If this wheelchair is not intended for use as a seat in motor vehicles and does not have the TTDS option fitted, the product must be labelled as specified below:

- Clauses, 8.2 (d) (ii) For AS/NZS 3696.19 Non-compliant chairs, warning label with the words ‘Not AS/NZS 3696.19 compliant’
- Clause 8.2 (d)(ii) A,B,C Label to have correct font size, contrast & location on chair
- Clause 8.2 (e) (i, ii,iii) Label/s to be permanent and durable

WW. End of remarks -----

AS/NZS ISO 7176.1:2015 (ISO 7176-1:2014) – DETERMINATION OF STATIC STABILITY

Testing method: (To AS/NZ ISO 7176.1:2015)	Result of measurement (°) Requirement, minimum 10° as per AS/NZS 3695.2:2013 (Unless fitted with anti-tips)		Result of measurement (°) Max safe slope as claimed by manufacturer (if greater)	
5.3 Tested with roll restraint when a castor wheel, pivot wheel, or pivot drive wheel is unlocked			Yes	
5.4 Tested with slide restraint when a castor wheel, pivot wheel, or pivot drive wheel is locked			No	
5.4 Tested with slide restraint when a drive wheel, manoeuvring wheel or guide wheel is locked or unlocked			Yes	
8. Test for static stability in the forwards direction (Wheelchair facing down the slope)				
8.1a) For wheelchairs with non-lockable front wheels, measure tipping angles as per 8.2 and 8.4 only 8.1b) For wheelchairs with lockable front wheels, measure tipping angles as per 8.2 to 8.5				
8.2 Downhill wheels unlocked -Tested using roll restraint				
Least stable condition	>10.5°		NA	
8.3 Downhill wheels locked -Tested using slide restraint				
Least stable condition	NA (Front wheels non locking)		NA	
8.4 Downhill wheels unlocked -Tested using roll restraint				
Most stable condition	>10.0°		NA	
8.5 Downhill wheels locked -Tested using slide restraint				
Most stable condition	NA (Front wheels non locking)		NA	
9. Test for static stability in the rearwards direction (w/chair facing up the slope)				
9.1.1 For wheelchairs with non-lockable rear wheels, measure tipping angles as per 9.2 and 9.4 only 9.1.2 For wheelchairs with lockable rear wheels, measure tipping angles as per 9.2 to 9.5				
9.2 Downhill wheels unlocked - Tested using roll restraint				
Least stable condition	Tipping commences at 11.0°		NA	
9.3 Downhill wheels locked – Tested using slide restraint				
Least stable condition	Tipping commences at 7.8°		NA	
9.4 Downhill wheels unlocked – Tested using roll restraint				
Most stable condition	>10.0°		NA	
9.5 Downhill wheels locked – Tested using slide restraint				
Most stable condition	Tipping commences at 8.2°		NA	
10. Test for static stability, lateral orientation – (Wheelchair facing across the slope)				
10.2.3 Tested with any lockable wheels locked				
10.2 Least stable condition	>10.0° LH	>10.0° RH	NA	NA
10.3 Most stable condition	>10.0° LH	>10.0° RH	NA	NA
11. Static stability with forward or rearward anti-tip devices				
11.2 Anti-tip devices in least effective configuration , Wheelchair in least stable condition			>10.0°	
11.3 Anti-tip devices in most effective configuration, Wheelchair in least stable condition			>17.0°	
11.4 Effectiveness of anti-tip devices in most effective configuration (If chair stability is less than10°)			NA (>10°)	
Remarks: No adverse or unexpected movement of chair during stability tests other than comments noted above.				

The sample submitted for this test satisfies the relevant requirements of AS/NZS ISO 7176.1:2015 (ISO 7176-1:2014) Except the methods indicated in this report as “not tested” and/or tested with deviations) for user mass 114 kg

PASS

AS/NZS 3695.1:2011 and AS/NZS ISO 7176.3:2015 – DETERMINATION OF BRAKE EFFICIENCY, PARKING BRAKE TEST

Test	Angle when movement commences	Type of movement (e.g. turning, Sliding, tyre rolling)	Specification according to AS3695.1	Reference in clause of AS/NZS ISO 7176.3:2015
Force to apply brakes for tests below:	55 N			
As measured before brakes fatigue tests				
Parking brakes facing down slope	>8.5°	No slipping or creeping	>7°	7.2
Parking brakes facing up slope	>8.5°	No slipping or creeping	>7°	7.2

Test	N° of fatigue cycles	Specification according to AS/NZS ISO 7176.8:2015	Reference in clause of ISO 7176.8:2015	Reference in clause of ISO 7176.8:2015
Brakes fatigue	60,000 Cycles	60,000 cycles	10.5	10.5

Test	Angle when movement commences	Type of movement (e.g. turning, sliding, tyre rolling)	Specification according to AS3695.1	Reference in clause of AS/NZS ISO 7176.3:2015
As measured after brakes fatigue tests				
Parking brakes facing down slope	>8.5°	No slipping or creep at 9°	>7°	7.2
Parking brakes facing up slope	>8.5°	No slipping or creep at 9°	>7°	7.2

Remarks:

None. WW. End of remarks -----

The sample submitted for this test satisfies the relevant requirements of AS/NZS 3695.1:2011 and AS/NZS ISO 7176.3:2015 (except the methods indicated in this report as “not tested” and/or tested with deviations) for user mass 114 kg

PASS

AS3695.1:2011, AS3696.5:1989 – OVERALL DIMENSIONS, MASS AND TURNING SPACE

Overall dimensions (Clause 5 of AS3696.5)					
Dimensions, to the nearest 10mm	Measured value	Reference in clause of AS3696.5	Dimensions, to the nearest 10mm	Measured value	Reference in clause of AS3696.5
Dimensions ready for occupation		5.1	Folded dimensions		5.2
Length, mm	1140 / 1255*	5.1.1	Min. folded length, mm	940	5.2.1
Length (no footrest or support or anti-tips), mm	855	5.1.2	Min. folded width, mm	680	5.2.2
Width, mm	725	5.1.3	Min. folded height, mm	850	5.2.3
Overall height, mm (Push handle min / max)	1055 / 1200	5.1.4	Min folded volume, m ³ .	0.54 m ³	5.2.4
Mass	37.8 kg	6	Turning space		7
			Min. turning radius, mm	830	7.1
			Min. turn between walls, mm	1495	7.2

Measurements marked * taken with anti-tips, no asterix without anti-tips. WW. End of remarks -----

AS3695.1:2011, ISO 7176-7:1998 DIMENSIONS

Dimension	Measured values Min/Max	Reference dimension in ISO 7176-7	Dimension	Measured values Min/Max	Reference dimension in ISO 7176-7
Seat plane angle, °	4.0°	1	Armrest height, mm	255	16
(Measured with tilt function)	+15.0 ~ -40.0°	1			
Effective seat depth, mm	510	2	Front of armrest to backrest	365	17
Effective seat width, mm	455	4	Armrest length, mm	365	18
Seat surface height, front edge, mm (Seat at 4.0°)	505	5	Armrest width, mm	50	19
Backrest angle, ° (Measured at sea plane 4.0°)	10.5° / 42.5°	6	Armrest angle	0°	20
Backrest height, mm (With seat cushion)	480	7	Distance between armrests	445	21
Backrest width, mm	450	8	Fr. loc'n of armrest structure	265	22
Footrest to seat distance, mm	435	11	Hand-rim diameter, mm	498	23
Footrest clearance, mm	30 ~ 85	12	Propelling wheel diameter	600	24
Footrest length, mm	150	13	Horizontal disp. of wheel axle	65	25
Footrest to leg angle (°)	90°	14	Vertical disp. of wheel axle	205	26
Leg to seat surface angle	97°	15	Castor wheel diameter	200	27

Wheelchair set-up details for ISO 7176-7:1998 measurements:

Dimensions taken with wheelchair setup as per details on Page 5, using Adult size RLG as per referenced standard requirements for 114 kg user weight, w/chair with hand-rims. No additional accessories fitted to the wheelchair.

The sample submitted for this test satisfies the relevant requirements of AS3696.1:2011 and ISO 7176-7:1998 Except the methods indicated in this report as "not tested" and/or tested with deviations) for user mass 114 kg

PASS

ISO 7176-5:2008 Wheelchairs – Part 5: Determination of dimensions, mass and manoeuvring space			
Measured wheelchair aspect	Measured value (mm)	Measured wheelchair aspect	Measured value (mm)
8.2 Overall length	1255	8.10 Mass of heaviest part	NA
8.3 Overall width	725	8.11 Pivot width	1220*
8.4 Handgrip height	1055	8.12 Reversing width	NA
8.5 Stowage length	940	8.13 Turning diameter	830*
8.6 Stowage width	680	8.14 Ground clearance	142*
8.7 Stowage height	850	8.15 Required width of angled corridor	965*
8.8 Rising	118	8.16 Required doorway entry depth	1180*
8.9 Total mass	37.8 kg	8.17 Required corridor width for side opening	1145*

Remarks:

Values marked * supplied from PDG Mobility (Specific to ISO 7176-5:2008 requirement for FDA submission)

The sample submitted for this test satisfies the relevant requirements of AS/NZS 3696.5:1989 AS3695.1:2011, ISO 7176.7:1998, ISO 7176-5:2008 (Except the methods indicated in this report as “not tested” and/or tested with deviations) for user mass 114 kg
Wheelchair is Group II category – (A user mass between 50 kg and 125 kg)

PASS

AS/NZS 3695.1:2011 and AS/NZS ISO 7176.8:2015 (ISO 7176-8:2014) STATIC TESTS				
Test method for static strength	Actual force applied, (N)	Specification according to a table of AS/NZS ISO 7176.8:2015	Result of strength test	Reference in AS/NZS ISO 7176.8
		Force for 114 kg user mass (N)		
Armrest resistance to downward forces (No test dummy fitted)	1740 N	1736 N (Both)	PASS	8.4
Footrest resistance to downward forces (No test dummy fitted)	1120 N	1118 N	PASS	8.5
Tipping levers downwards load (Test dummy fitted)	NA	1000 N	NA	8.6
Handgrips (Test dummy fitted)	750 N	750 N	PASS	8.7
Armrests resistance to upward forces (Test dummy fitted)	1010 N	1000 N	PASS	8.8
Footrest resistance to upward forces (Test dummy fitted)	510 N	507 N (Each)	PASS	8.9
Push handle resistance to upward load (Test dummy fitted)	1760 N	1760 N	PASS	8.10

Remarks:

Static strength tests performed before impact and fatigue tests. No failures during impact tests. Post-test inspection ok. Manufacturer makes no claim for strength performance above minimum requirements of the referenced standard.
Wheelchair setup as per details on Page 5 with 114 kg test dummy fitted as per static strength requirements.
WW. End of remarks -----

The sample submitted for this test satisfies the relevant requirements of AS/NZS 3695.1:2011, AS/NZS ISO 7176.8:2015 & ISO 7176-8:2014 (except the methods indicated in this report as “not tested” and/or tested with deviations) for user mass 114 kg

PASS

**AS/NZS 3695.1:2011 and AS/NZS ISO 7176.8:2015 (ISO 7176-8:2014)
IMPACT TESTS**

Test method for impact strength	Result of test and mode of failure (see list of failures above)	Reference in AS/NZS ISO 7176.8
Backrest resistance to impact (DUMMY THIGHS ONLY FITTED)	PASS 30°	9.3
Hand-rim resistance to impact (DUMMY FITTED)	PASS 45°	9.4
Castors (DUMMY FITTED)	PASS 53.3°	9.5
Footrests resistance to lateral impact (DUMMY FITTED)	PASS 53.3°	9.6.3
Footrests resistance to longitudinal impact (DUMMY FITTED)	PASS 53.3°	9.6.4
Anti-tip devices – Upwards impacts (3 Times with test dummy fitted)	PASS, 15 mm	9.7.1
Anti-tip devices – Longitudinal impact (Test dummy fitted)	PASS	9.7.2
Anti-tip devices – Lateral impact (Test dummy fitted)	PASS	9.7.3

Remarks:

Static strength and impact tests performed before the fatigue tests. No failures during impact tests. Post-test inspection ok. Manufacturer makes no claim for impact strength above minimum requirements of the referenced standard.
Wheelchair setup as per details on Page 5 with 114 kg test dummy fitted as per impact strength requirements.
WW. End of remarks -----

The sample submitted for this test satisfies the relevant requirements of AS/NZS 3695.1:2011, AS/NZS ISO 7176.8:2015 & ISO 7176-8:2014 (except the methods indicated in this report as “not tested” and/or tested with deviations) for user mass 114 kg

PASS

**AS/NZS 3695.1:2011 and AS/NZS ISO 7176.8:2015 (ISO 7176-8:2014)
FATIGUE TESTS**

Test method for fatigue strength	Actual number of cycles (Or cycles recorded at failure)	Specification according to AS/NZS ISO 7176.8, number of cycles	Mode of failure (see list of failures in table below)	Reference in AS/NZS ISO 7176.8
Two drum test	200,000 Cycles	200,000 Cycles	None	10.3
Drop test	6,666 Cycles	6,666 Cycles	None	10.4

Remarks:

Fatigue tests were performed after static strength and impact tests. No failures during fatigue tests, post-test inspection ok. Manufacturer makes no claim for fatigue strength above minimum requirements of the referenced standard.
Wheelchair setup as per details on Page 5 with 114 kg test dummy fitted as per fatigue strength requirements.
WW. End of remarks -----

The sample submitted for this test satisfies the relevant requirements of AS/NZS 3695.1:2011, AS/NZS ISO 7176.8:2015 & ISO 7176-8:2014 (except the methods indicated in this report as “not tested” and/or tested with deviations) for user mass 114 kg

PASS

STRENGTH REQUIREMENTS AS/NZS ISO 7176.8:2015 Confirmation of strength test requirements – Post-test – Clause 4		
Test requirement.	Result following all strength tests	Reference in AS/NZS ISO 7176.8 (Clause 4)
No component to show evidence of visible cracks, be fractured or have become detached	PASS	4.1 a)
No externally visible cable shall be cut, abraded or crushed No externally visible electrical connector shall be crushed or disconnected	NA	4.1 b)
All parts intended to move, rotate or be removable, folding or adjustable shall operate as req'd.	PASS	4.1 c)
All power operated systems shall operate as described by the manufacturer	NA	4.1 d)
Handgrips shall not be displaced	PASS	4.1 e)
No component or assembly of parts shall exhibit visible plastic deformation, free play or loss of adjustment that adversely affects the function of the wheelchair	PASS	4.1 f)
The brake mechanism shall not have moved from the pre-set condition	PASS	4.1 g)

**AS/NZS ISO 7176.11:2013 - Equivalent and identical to:
ISO 7176-11:2012, Wheelchairs, Part 11: Test dummies**

Test dummy set-up details:

Thigh load plate	L ₁	L ₂	L ₃	L ₄
	340 mm (Wide)	420 mm (Deep)	110 mm	135 mm
Torso load plate	L ₅	L ₆		
	350 mm (Wide)	540 mm (High)		
Foot load plate	L ₇	L ₈		
	100 mm (Wide)	300 mm (Long)		
Segment masses – Distribution as below:				
^M Torso	61 kg			
^M Thigh	45 kg			
^M Leg	8 kg			
Total Dummy Mass	114 kg/ 250 lb			
Torso load pad cushion		t = 30 mm (Uncompressed foam to Clause 6.3 specification)		
Thigh load pad cushion		t = 30 mm (Uncompressed foam to Clause 6.3 specification)		
Centre of Mass				
Torso segment	^x Torso ^B 145 mm		^y Torso ^B 340 mm	
Thigh segment	^x Thigh ^B 340 mm		^y Thigh ^B 145 mm	
Lower leg	^x Leg ^B 490 mm		^x Leg ^y 160 mm	
Overall centre of mass of test dummy determined by balance method (Appendix A – Normative) TLE001 Centre of mass test fixture used for this determination.				

**AS 3696.13-1991 Part 13 - Equivalent and identical to:
ISO 7176-13:1989, Wheelchairs Part 13: Determination of coefficient of friction
of test surfaces.**

Equipment used for determination of coefficient of friction:			
	Name of apparatus	Last calibration date	Calibration result
TLE134	Friction test block – 5.0 kg	26/08/2016	Pass (>1.3)
TLE030	Spring balance 0 - 20 kg	18/04/2016	Pass (+/- 1%)
Calibrated test surfaces:			
TLE012	Static stability ramp	18/11/2016	Co-efficient of friction 0.98 (22°C, 68% RH)
Test surface description:	0 - 45° Inclinable test plane of timber construction & coated with non-slip surface treatment conforming to co-efficient of friction requirements (Averaged measurement over 3 areas) Mopped & vacuumed before tests. Co-efficient measured in horizontal plane. Calibration result: Pass, acceptable for use.		
TLE010	Drop test surface	02/09/2016	Co-efficient of friction 1.0 (21°C, 52% RH)
Test surface description:	Rigid horizontal concrete surface conforming to co-efficient of friction requirements (Averaged measurement over 3 areas) Mopped & vacuumed before tests. Calibration result: Pass, acceptable for use		

Traceable Equipment used for Measurements in this report (All indicated equipment in current calibration)					
Gauge #	Gauge Type		Gauge #	Gauge Type	
TLE004	Standard finger Probe	<input checked="" type="checkbox"/>	TLE141	Tape Measure, 5 Metre	<input checked="" type="checkbox"/>
TLE009	Cold Climate Chamber	<input type="checkbox"/>	TLE144	Stop Watch	<input checked="" type="checkbox"/>
TLE010	Test Rig (Static Load Drop)	<input checked="" type="checkbox"/>	TLE148	Protractor, Vernier	<input checked="" type="checkbox"/>
TLE011	2 Drum Durability Rig	<input checked="" type="checkbox"/>	TLE151	Accelerometer	<input type="checkbox"/>
TLE012	Stability Ramp - Static	<input checked="" type="checkbox"/>	TLE167	Test Masses, 25kg	<input type="checkbox"/>
TLE016	Square, Steel - Large	<input type="checkbox"/>	TLE175	2 Drum Durability rig	<input type="checkbox"/>
TLE018	Rule, Steel – 1,000 mm	<input type="checkbox"/>	TLE176	Test Dummy	<input type="checkbox"/>
TLE019	Reference Load Gauge	<input checked="" type="checkbox"/>	TLE179	Test Rig Prosthetics, Foot	<input type="checkbox"/>
TLE024	Stability Ramp, Dynamic	<input type="checkbox"/>	TLE182	Multimeter	<input type="checkbox"/>
TLE028	Spring Balance 0-100g	<input type="checkbox"/>	TLE183	Impact Pendulum	<input checked="" type="checkbox"/>
TLE029	Spring Balance 0– 5kg	<input type="checkbox"/>	TLE184	Test Dummy	<input type="checkbox"/>
TLE030	Spring Balance 0-20kg	<input type="checkbox"/>	TLE185	Inclinometer	<input checked="" type="checkbox"/>
TLE032	Thermometer	<input type="checkbox"/>	TLE186	Inclinometer, small	<input type="checkbox"/>
TLE049	Torque Wrench	<input type="checkbox"/>	TLE196	Test Rig Prosthetics, Knee	<input type="checkbox"/>
TLE067	Tyre Pressure Gauge	<input type="checkbox"/>	TLE201	Load Cell	<input checked="" type="checkbox"/>
TLE068	Impact Mass, 25 kg Soccer	<input checked="" type="checkbox"/>	TLE203	Impactor	<input type="checkbox"/>
TLE077	Force Gauge, RLG	<input checked="" type="checkbox"/>	TLE204	Pendulum Impact Hammer	<input type="checkbox"/>
TLE084	Rule, Steel – 300mm	<input type="checkbox"/>	TLE205	Tape Measure, 8 Metre	<input type="checkbox"/>
TLE087	Test Obstacles	<input type="checkbox"/>	TLE210	Test Obstacle, Threshold	<input type="checkbox"/>
TLE105	Thermohygrograph	<input checked="" type="checkbox"/>	TLE211	Prosthetic Set up Gauge	<input type="checkbox"/>
TLE106	Scales, Digital	<input checked="" type="checkbox"/>	TLE212	Test Rig, Proof Test	<input type="checkbox"/>
TLE112	Vernier Caliper, 200mm	<input type="checkbox"/>	TLE216	Load Pad, Seat Base	<input type="checkbox"/>
TLE114	Spring Balance, 50kg	<input type="checkbox"/>	TLE218	Square, Steel - Small	<input type="checkbox"/>
TLE131	Test Dummy	<input type="checkbox"/>	TLE220	DC Wattmeter	<input type="checkbox"/>
TLE132	Test Dummy	<input type="checkbox"/>	TLE221	Temp/Humidity Meter	<input type="checkbox"/>
TLE133	Test Dummy	<input checked="" type="checkbox"/>	TLE225	Caliper, Digital 200mm	<input checked="" type="checkbox"/>

NOTES

- 1U₉₅ 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.
- 6 Items marked NA – Not applicable to sample tested

END OF REPORT