TEST REPORT FOR

Product Design Group Fuze T50

Manual Wheelchair, 400 lbs / 181.8 kg

(Section 8 Static, impact & fatigue tests)

TEST DOCUMENTS:

AS/NZS 3695.1:2011

Part 1: Requirements and test methods for manual wheelchairs

LABORATORY REFERENCE

493316

24th September 2020

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) ISO 7176-5 Second edition 2008-06-01 Part 5: Determination of overall dimensions, mass and turning 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

Job Number: 493316

PRODUCT

Name and Model No:
Product Design Group Inc.
Fuze T50 Manual wheelchair

Serial No:
102554

Maximum User Mass:
Tested to 400 lbs / 181.8 kg
Labelled 350 lbs / 159 kg

Documents used in this report:
As referenced on page 2 of this report

Front Isometric View of Sample

SUPPLIER

Name:
Product Design Group Inc.

Address:
103-318 East Kent Avenue South
Vancouver BC VSX 4N6
Canada

Contact Person:
Torr Brown

Telephone: n/a

Email: TBrown@pdgmobility.com

Order Number: Email confirmation

Order Date: 7/08/2020

TESTING AUTHORITY

Name: Novita Children's Services, NovitaTech Test Laboratory

Address: 1 South Road, Thebarton, South Australia 5031

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Reason: I attest to the accuracy and integrity of this document
Date: 2020.09.24 14:50:04 +09'30'

Checked: Leonie Rich-Perrett
Test Technician

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Date: 2020.09.24 14:20:04 +09'30'

Dates of testing period:
September, 2020

Dates of issue of this report:
24th September 2020

DETAILED PRODUCT DESCRIPTION

Name/model number:
Product Design Group Inc. Fuze T50 Manual wheelchair with tilt-in-space function

Production or prototype sample:
Production sample

Material:
Cast aluminium main frame with tubular aluminium components, aluminium seat base, plastic rims front and rear, plastic footplates, upholstered sling type backrest.

Functional description:
Rigid frame with tilt in space function, removable armrests & footrests, attendant or self-propelled

Pre-test Inspection:
Assembled and inspected pre-test, ok condition

PHOTOS OF SAMPLE (BEFORE TESTING)

Front View

Rear isometric view

Front isometric, tilt in space

Side view, partial tilt

DETAILED PRODUCT DESCRIPTION (CONTINUED)

Manufacturer:		
Name	Product Design Group Inc.	
Address	103-318 East Kent Avenue South, Vancouver BC VSX 4N6, Canada	
General:		
Chair type	Manual wheelchair	
Size	Adult to 400 lbs / 181.8 kg	
Frame type	Rigid frame with tilt function	
Body support system		
Seat	Metal seat platform with contoured upholstered seat cushion	
Back support	Sling type fabric backrest with padding	
Arm support	Removable, height adjustable arm supports with padded armrests	
Lower leg support	Heel straps fitted to footrests	
Foot support	Removable, height adjustable, swing-up foot plates with heel straps	
Head support	No head support	
Design Features:		
Tilt	Tilt in space function	
Recline	No recline function	
Anti-tips	Rear anti-tips fitted	
Push handles	Single 1 piece handle, angle adjustable	
Other features	Fold forward backrest	
Wheels:		
Castor wheels	Front castor wheels with pneumatic tyres	Size: 200 Ø x 50
Manoeuvring Wheels	Plastic rims with solid tyres, aluminium hand-rims	Size: 510 Ø x 35

Ambient test temperature: 22 ° C

Note: Other descriptive dimensions are included in the AS/NZS 3695.1 Appendix B and ISO 7176-7 sections of this test report

AS/NZS 3695.1:2011 APPENDIX B
OVERALL DIMENSIONS, MASS AND TURNING SPACE

Clause	Test Requirement	Specification	Result
Record following properties of wheelchair, as measured by ISO 7176-5 or as specified in Appendix B:			
App.B a)	Height range of push handles (if fitted)	Adjustable within height range of 900-1200mm	900 - 1180 mm
App.B b)	Ground clearance of the occupied wheelchair		50 mm
App.B c)	Dimensions as specified in Table B1, Appendix B		See table B1
App.B d)	Mass of wheelchair when ready for use (kg)		32.2 kg
	Mass of heaviest component when dismantled		NA

AS/NZS 3695.1:2011 CLAUSE 4 – TEST APPARATUS, SET-UP AND ORDER OF TESTING

4.2 Test Dummy		
Test dummy as specified in AS/NZS ISO 7176.11	Dummy size: Adult	Dummy weight: 400 lb / 181.8 kg
4.3 Set up (wheelchair with handrims)		
Procedures as per AS/NZS ISO 7176.22:2015 (ISO 7176-22:2014) – *Appendix B (informative requirements)*		
Adjustable part	**Type of Equipment**	**Value / Position / Measurement**
Properties for seating and ergonomics		
Seat plane angle	TLE 185 measure	4.8°
Effective seat depth	TLE 141 measure	510 mm
Effective seat width	TLE 141 measure	435 mm
Seat surface height at front edge	TLE 141 measure	525 mm (No tilt)
Back support angle	TLE 185 measure	15.7°
Back support height	TLE 141 measure	475 mm
Handgrip height	TLE 141 measure	900 - 1180 mm
Back support width	TLE 141 measure	440 (At centres)
EITHER Footrest to seat	TLE 141 measure	445 mm
OR Foot support clearance	TLE 141 measure	55 mm
Foot support length	TLE 141 measure	150 mm
Foot support to leg angle	TLE 185 measure	110°
Leg to seat surface angle	TLE 185 measure	105°
Arm support height	TLE 141 measure	310 (At max)
Wheelchairs with hand-rims: Front of arm support to back support	TLE 141 measure	475 mm
Wheelchairs with hand-rims: Hand-rim diameter	TLE 141 measure	415 mm
Wheelchairs with hand-rims: Manoeuvring wheels, diameter	TLE 141 measure	510 mm
Wheelchairs with hand-rims: Wheelbase	TLE 141 measure	460 mm
Wheelchairs with hand-rims: Camber	TLE 185 measure	0°
Wheelchairs with hand-rims: Manoeuvring wheels horizontal position	TLE 141 measure	25 mm
Wheelchairs with hand-rims: Manoeuvring wheels vertical position	TLE 141 measure	260 mm
Wheelchairs with hand-rims: Castor wheels, diameter	TLE 141 measure	200 mm
Properties of the chassis		
Wheelchairs with hand-rims: Manoeuvring wheels, track		585 mm
Wheelchairs with hand-rims: Manoeuvring wheels, air pressure	TLE 067 measure	NA (Solid)
Wheelchairs with hand-rims: Castor wheels, track		530 mm
Wheelchairs with hand-rims: Castor wheels, air pressure	TLE 067 measure	2.5 bar
Castor rake	TLE 185 measure	0°
Castor cant	TLE 185 measure	0°
Castor trail	TLE 141 measure	65 mm
Anti-tip device		NA (Fixed position/height)
Kerb climber		NA (None)
Other adjustable components		NA (none)
Distance b/w brake blocks and their contact surfaces	TLE 141 measure	15 mm
Note: NA referenced for items that are not adjustable or applicable to this wheelchair.		

Remarks:

Wheelchair is set up to the requirements of AS/NZS ISO 7176.22:2015, except when the specific design configuration of the chair does not allow this. Adjustable parts that are not meant for user adjustment are kept as supplied by manufacturer and marked as 'NA' in the above table. WW. End of remarks ----------

AS/NZS ISO 7176.3:2015 (ISO 7176-3:2012) & AS/NZS ISO 7176.8:2015
DETERMINATION OF EFFECTIVENESS OF BRAKES (PARKING BRAKE TESTS)

Clause AS/NZS ISO 7176.3	Test Requirement	Specification (as per AS/NZS 3695.1)	Type of movement (e.g. turning, sliding, tyre rolling)	Result
7.2	**Manually Operated Brakes**			
7.2 f)	Force to apply brakes			Set to 60 N
Before fatigue test				
7.2 g)	Parking brakes facing down slope	>7°	No sliding or creep	PASS, >7.0°
7.2 i)	Parking brakes facing up slope	>7°	No sliding or creep	PASS, >7.0°
After fatigue test				
7.2 g)	Facing down slope (after fatigue)	>7°	No sliding or creep	PASS, >7.0°
7.2 i)	Facing up slope (after fatigue)	>7°	No sliding or creep	PASS, >7.0°

Clause AS/NZS ISO 7176.8:2015	Test Requirement	Specification	N° of fatigue cycles operated	Result
10.5	**Parking Brake Fatigue Test**			
10.5	Brake fatigue test	60,000 Cycles	60,000 Cycles	PASS

Remarks:

Brake fatigue tests performed after 2 drum and drop tests.
WW. End of remarks ----------

The sample submitted for this test satisfies the relevant requirements of AS/NZS ISO 7176.8:2015 (except the methods indicated in this report as “not assessed” and/or tested with deviations) for user mass 181.8 kg / 400 lb

PASS

AS/NZS ISO 7176.8:2015 – STATIC, IMPACT AND FATIGUE TESTS

Static Strength Tests					
Clause	**Test Requirement**	**Specification according to AS/NZS ISO 7176.8**		**Actual force applied, (N)**	**Result**
		Force for 100kg user at 32.2kg chair mass (N)	**Force for 181.8kg user at 32.2kg chair mass (N)**		
8.4	Armrest resistance to downward forces (No dummy fitted)	761 N	952 N (Each)	1905 N (Both)	PASS
8.5	Footrest resistance to downward forces (No dummy fitted)	981 N	1226 N	1226 N	PASS
8.6	Tipping levers downwards load (Dummy fitted)	1000 N	1000 N	NA	NA (None)
8.7	Handgrips (Dummy fitted)	750 N	750 N	750 N	PASS
8.8	Armrests resistance to upward forces (Dummy fitted)	900 N	1000 N	1000 N	PASS
8.9	Footrest resistance to upward forces (Dummy fitted)	486 N	486 N	486 N (Each)	PASS
8.10	Push handle resistance to upward load (Dummy fitted)	1760 N	1760 N	1760 N (Each)	PASS

Remarks:

Static tests performed before impact tests. WW. End of remarks ----------

Impact Strength Tests		
Clause	**Test Requirement**	**Result**
9.3	Backrest resistance to impact (Dummy thighs only fitted)	PASS (30°)
9.4	Hand-rim resistance to impact (Test dummy fitted)	PASS (45°)
9.5	Castors (Test dummy fitted)	PASS (64°)
9.6.3	Footrests resistance to lateral impact (Test dummy fitted)	PASS (64°)
9.6.4	Footrests resistance to longitudinal impact (Test dummy fitted)	PASS (64°)
9.7.1	Anti-tip devices – Upwards impacts (3 Times with test dummy fitted)	PASS (15 mm)
9.7.2	Anti-tip devices – longitudinal impact (Test dummy fitted)	PASS (64°)
9.7.3	Anti-tip devices – Lateral impact (Test dummy fitted)	PASS (41°)

Remarks:

Impact tests performed after static load tests. WW. End of remarks ----------

AS/NZS ISO 7176.8:2015 – STATIC, IMPACT AND FATIGUE TESTS (CONTINUED)

Fatigue Tests				
Clause	**Test requirement**	**Specification**	**Actual number of cycles (or cycles recorded at failure)**	**Mode of failure (see list of failures below)**
10.3	Two drum test	200,000 Cycles	200,000 Cycles completed	No failure
10.4	Drop test	6,666 Cycles	6,667 Cycles completed	No failure

Remarks:

2 Drum test and drop test completed after static load tests.
WW. End of remarks ----------

Strength Requirements Confirmation of strength test requirements – Post-test		
Clause	**Test Requirement**	**Result**
4.1 a)	No component to show evidence of visible cracks, be fractured or have become detached	PASS
4.1 b)	No externally visible cable shall be cut, abraded or crushed No externally visible electrical connector shall be crushed or disconnected	NA (None)
4.1 c)	All parts intended to move, rotate or be removable, folding or adjustable shall operate as req'd.	PASS
4.1 d)	All power operated systems shall operate as described by the manufacturer	NA (None)
4.1 e)	Handgrips shall not be displaced	PASS
4.1 f)	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 g)	The brake mechanism shall not have moved from the pre-set condition	PASS

Remarks:

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

The sample submitted for this test satisfies the relevant requirements of AS/NZS ISO 7176.8:2015 (except the methods indicated in this report as "not assessed" and/or tested with deviations) for user mass 181.8 kg / 400 lb

PASS

Traceable Equipment used for Measurements in this report

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

NOTES

1. Uncertainty of measurement (U_m) has been calculated for linear, angle, force, mass, temperature, cycles and count measurements and meets the referenced standards' specifications.
2. Kgf to N conversion calculations take into account any difference in standard gravity (g_n) to local measurement (g) obtained from the world geodetic system.
3. 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.
4. All instruments either carried valid calibration certificates throughout the test period or were checked against traceable Standards before and after use.
5. 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).
6. Any non-conformances are indicated in red.

END OF REPORT