MDD Report: EN 12184:2014

Equipment under Test:	Electric wheelchair
Model /Type:	SEW01, SEW02
Applicant:	HEDY Medical Device Co.,Ltd.
Address:	No.286,Science Avenue,Guangzhou High and New Tech Development Zone,510663.P.R.China
Manufacturer:	HEDY Medical Device Co.,Ltd.
Address:	No.286,Science Avenue,Guangzhou High and New Tech Development Zone,510663.P.R.China
Laboratory:	Deu Technology Testing Co.,Ltd.
Address:	Floor 6, West tower, No.11-1,Creative Industry park ,Haizhu district, Guangzhou, Guangdong , China
Report Number	DEU(18)-08-H1001M
Release Date	2018-08-23
Tel:	400-686-9618

Tested By: ***Mandy Huang*** **Date:** **2018-07-30**

Approved By: ***Louis Lau*** **Date:** **2018-07-30**

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Electrically powered wheelchairs, scooters and their chargers -

Requirements and test methods

Testing Laboratory	
Name.....:	Guangzhou Deu Technology Testing Co., Ltd.
Address .....:	Floor 6, West tower, No.11-1,Creative Industry park, Haizhu district, Guangzhou, Guangdong , China
Testing location.....:	As above

Possible test case verdicts	
- test case does not apply to the test object:	N/A
- test object does meet the requirement :	P(Pass)
- test object does not meet the requirement:	F(Fail)

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item tested.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

General product information:

Copy of marking plate(s):

Product: Electric wheelchair

Model: SEW01

Ratings: 24VDC,

HEDY Medical Device Co.,Ltd.

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Clause	Requirement - Test	Result - Remark	Verdict
5	Type classes		--
	Wheelchairs shall be classified in one or more of the following three classes, dependent upon their intended use:		N
	Class A: compact, manoeuvrable wheelchairs not necessarily capable of negotiating outdoor obstacles;	Class A	P
	Class B: wheelchairs sufficiently compact and manoeuvrable for some indoor environments and capable of negotiating some outdoor obstacles;		N
	Class C: wheelchairs, usually large in size, not necessarily intended for indoor use but capable of travelling over longer distances and negotiating outdoor obstacles.		N
	NOTE Scooters are included within the classes above.		N
6	General requirements	Considered	P
	The wheelchair shall conform to the requirements specified in EN 12182 for the following:		P
	intended performance and technical documentation;		P
	aids that can be dismantled;	Only personal use	N
	single-use fasteners;		P
	biocompatibility and toxicity;		P
	contaminants and residues;		P
	infection and microbiological contamination;		P
	overflow, spillage, leakage and ingress of liquids;		P
	safety of moving parts;		P
	prevention of traps for parts of human body;		P
	folding and adjusting mechanisms;		P
	surfaces, corners and edges;		P
	clinical evaluation;		P
	ergonomics.		P
7	Preparation for testing		
7.1	General	Considered	P
	Unless otherwise specified in Clauses 8, 9, 10, 11 and 12, the wheelchair shall be prepared for testing as specified in ISO 7176-22:2000 with the following modification.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	If a test procedure requires the use of a test dummy or human test occupant, they shall be selected and fitted as specified in 7.2 or 7.3. NOTE This instruction supersedes instructions for loading the wheelchair in the referenced standards.		
7.2	Test dummy		P
	Select a test dummy, as specified in ISO 7176-11:2012, of mass equal to the maximum occupant mass specified by the wheelchair manufacturer, with a tolerance of 0 kg to +5 kg. Fit the test dummy in the wheelchair as specified in ISO 7176-22:2000.		P
7.3	Human test occupant		N
	Select a human test occupant whose mass, in combination with any supplementary weights as specified in 4.7, is equal to the maximum occupant mass specified by the wheelchair manufacturer, with a tolerance of 0 kg to + 5 kg.		N
	Seat the occupant in the wheelchair and position and secure the supplementary weights to give substantially the same mass distribution as the test dummy when fitted as specified in ISO 7176-22:2000.		N
	WARNING – This testing is potentially hazardous to a human test occupant and other test personnel. Appropriate safety precautions should be taken to avoid injury.		N
8	Wheelchair performance		P
8.1	Performance of driving characteristics		P
8.1.1	General		P
	The loaded wheelchair shall meet the driving performance requirements specified in Table 1 and Table 2 for the type class of the wheelchair as specified in Clause 5.		P
8.1.2	Ability to climb rated slope		P
8.1.2.1	Requirements		P
	The wheelchair shall be capable of climbing at a speed not less than 2 km/h:	2.5 km/h	P
	the applicable rated slope for the type class of wheelchair specified in Table 1,		P

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Clause	Requirement - Test	Result - Remark	Verdict
	the rated slope specified by the manufacturer, whichever is greater.		P
	The wheelchair passes the test specified in 8.1.2.2 if it achieves or exceeds a speed of 2 km/h after travelling 5 m up the slope.	2.5 km/h	P
8.1.3	Ground unevenness		P
8.1.3.1	Principle		P
	It is important that a wheelchair is able to drive on uneven terrain without stopping even if one wheel is at a higher level than the others.		P
8.1.3.2	Requirement		P
	The wheelchair shall be capable of driving when any of its wheels is raised to a height specified in Table 1 for ground unevenness.	Limit in Class C	P
8.1.4	Maximum downhill speed		P
8.1.4.1	Requirement		P
	The wheelchair shall not exceed 125 % of its maximum speed on the horizontal, when driving down — the applicable rated slope for the type class of wheelchair specified in Table 1, or — the rated slope specified by the manufacturer, whichever is greater.	115%, Limit in Class C	P
8.1.5	Dynamic stability		P
8.1.5.1	Requirements		P
	The dynamic response score of the wheelchair shall be 2 or 3 as specified in Table A.1 of ISO 7176-2:2001 when tested on — the applicable rated slope for the type class of wheelchair specified in Table 1, and — the rated slope specified by the manufacturer.	Limit in Class C	P
8.1.6	Obstacle climbing and descending		P
8.1.6.1	Requirements		P
	The wheelchair shall be capable of climbing and descending obstacles of the height specified in Table 1 for the type class of the wheelchair without any part of the wheelchair other than wheels or a kerb climbing device contacting the obstacle or the test plane.		P
8.1.7	Static stability		P

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Clause	Requirement - Test	Result - Remark	Verdict
8.1.7.1	Requirements		P
	The wheelchair shall meet or exceed the minimum requirements for static stability specified in Table 1 for the type class of the wheelchair.		P
8.1.8	Maximum speed		P
8.1.8.1	Requirements		P
	The maximum speed of the wheelchair when travelling forwards and travelling in reverse on the horizontal shall not exceed the maximum speed requirements specified in Table 1 for the type class of the wheelchair.		P
8.1.8.2	Test		P
	Test the loaded wheelchair as specified in ISO 7176-6:2001 for the maximum forward speed and maximum reverse speed on a horizontal surface.Record the results and determine whether the requirement has been met.		P
8.1.9	Distance range		P
8.1.9.1	Requirements		P
	The theoretical continuous driving distance range for the wheelchair shall not be less than the requirement specified in Table 1 for the type class of the wheelchair.		P
8.1.9.2	Test		--
	Load the wheelchair as specified in ISO 7176-4:2008, except that the mass of the load shall be the maximum occupant mass or 100 kg, whichever is the lower.		--
8.2	Static, impact and fatigue strength		P
8.2.1	Requirements		P
	The wheelchair shall conform to the requirements of ISO 7176-8:1998 with the exception that wheelchairs of Class A are not required to be tested as specified in ISO 7176-8:1998, 10.5, drop test.		-
	Arm supports shall conform to the static loading requirements of ISO 7176-8:1998 in all intended operating positions.		--
	For wheelchairs with a maximum occupant mass greater than 75 kg but not greater than 100 kg, the maximum upward force to be applied to each single push handle shall be (880 ± 26) N.		--

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Clause	Requirement - Test	Result - Remark	Verdict
	NOTE This is a correction of an erroneous value stated in Table 8 of ISO 7176-8:1998.		NA
	Where the manufacturer specifies a maximum occupant mass greater than 100 kg the forces specified in Table 3 shall apply.		NA
8.2.2	Test		--
	Test the wheelchair in accordance with ISO 7176-8:1998 with modifications as specified in 8.2.1.		--
8.3	Wheelchairs for use as seats in motor vehicles		P
	If the manufacturer specifies that the intended use of the wheelchair includes use as a seat in a motor vehicle by an occupant of mass 22 kg or greater, the wheelchair shall conform to the performance requirements of ISO 7176-19:2008 with the following modifications.		P
4.1.2	by the following:		P
	If a wheelchair is intended by the manufacturer to also be secured by a docking securement device in public transportation and/or different private vehicles, the securement points on the wheelchair and/or of the wheelchair tiedown adaptors shall conform to the performance requirements in Clause 5.		P
5.2.1 a)	If the wheelchair has a head restraint, the horizontal excursions of the ATD and the wheelchair, with respect to the impact sled, shall not exceed the limits in Table 7 at any time during the test.		P
	If the wheelchair does not have a head restraint, the horizontal excursions of the ATD and the wheelchair, with respect to the impact sled, shall not exceed the limits in Table 7 at any time during the test with the exception that the excursion of the back of the head of the ATD, X head, R , shall not be measured.		P
	Primary occupant-load-carrying components of the wheelchair shall not show visible signs of failure, unless there is a backup system to provide support.		P
8.4	Climatic performance	Considered	P
	The wheelchair shall conform to the requirements of ISO 7176-9:2009. NOTE This requirement includes the one stated in ISO 7176-14:2008, 13.1. It is not necessary to duplicate the test.		P
9	Component properties		P

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Clause	Requirement - Test	Result - Remark	Verdict
9.1	Foot supports, lower leg support assemblies and arm supports		P
9.1.1	Requirements		P
	The wheelchair shall be fitted with foot supports that have a means of positioning the occupant's feet at the required height and prevent the occupant's feet from sliding backwards.		P
	Any swing away, movable or removable foot support, lower leg support assembly or arm support fitted on the wheelchair shall:		P
	a) incorporate a means to locate it securely in any intended operating position, b) be adjustable in increments not exceeding 25 mm, c) be accessible and operable by the occupant or an assistant or both in accordance with the manufacturer's intended use of the wheelchair,	22mm	P
	d) be within the reach space shown in Figure 1, and e) be operable without the use of tools.		P
	NOTE The ability to make adjustments without the use of tools is not required. Where the wheelchair has separate foot supports which have a gap between them or the possibility of a gap being formed when they are loaded,		P
	f) means to prevent the occupant's feet from sliding into the gap shall be provided, or g) when the foot supports are tested in accordance with 9.1.2.2, any gap between them shall meet the requirement for safe distances between stationary parts specified in EN 12182.		P
9.1.2	Test methods		--
9.1.2.1	Test for general performance		--
	a) Fit foot supports, lower leg support assemblies and arm supports in the operating position(s) specified in the manufacturer's instructions.		--
	b) Adjust the foot supports, lower leg support assemblies and arm supports as specified in the manufacturer's instructions.		--
	c) Record whether the foot supports, lower leg support assemblies and arm supports have met the requirements.		--

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Clause	Requirement - Test	Result - Remark	Verdict
9.1.2.2	Test for foot support gap		P
9.2	Component mass		P
	If the wheelchair is intended to be dismantled for storage or transportation, any component that requires moving or handling that has a mass greater than 10 kg shall be provided with suitable handling devices (e.g.handles). The manufacturer shall provide information indicating the points where such components can be lifted and describing how they shall be handled during disassembly, lifting, carrying, and assembly to reduce risks to the person or persons moving or handling them.		P
9.3	Pneumatic tyres		P
	All pneumatic tyres on the wheelchair shall have the same type of valve connection. Valves should be readily accessible when using the intended inflating tool.		P
	The tyres or the rims shall be marked with the maximum pressure in kPa, bar or PSI.		P
9.4	Anterior pelvic support		P
	The wheelchair shall have provision for an anterior pelvic support to be fitted. The manufacturer of the wheelchair shall have available as an option an anterior pelvic support which can be used with that provision.		P
	NOTE The term 'support' is used in relation to occupant posture, and the term 'restraint' is used in relation to motor vehicle impacts.		P
9.5	Resistance to ignition		P
9.5.1	Upholstered composite parts		P
	For upholstered parts which are composites of cover and filling, with or without a support base or interliner, the complete composite shall be tested by the methods specified in EN 1021-2:2006 or ISO 8191-2:1988. Progressive smouldering ignition and flaming ignition as defined in the Standard applied shall not occur.		P
9.5.2	Foam materials		P

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Clause	Requirement - Test	Result - Remark	Verdict
	For foam materials which form all or part of a seat, back support, postural support, arm support or lower leg support and which consist of foam material with or without an integral skin, the material of each part shall be tested with the source applied centrally to the surface intended to support the occupant by the methods specified in EN 1021-2:2006 or ISO 8191-2:1988 (see Figure 2). Progressive smouldering ignition and flaming ignition as defined in the Standard applied shall not occur.		P
9.5.3	Other parts in contact with the occupant		P
	For sling seats, sling backs, belts, restraint harnesses, foot supports and clothing guards, the material of each item shall be tested with the source applied centrally to the surface intended to contact or support the occupant by the methods specified in EN 1021-2:2006 or ISO 8191-2:1988. Progressive smouldering ignition and flaming ignition as defined in the Standard applied shall not occur.		P
	Belts that are intended for use as restraints in motor vehicles may, as an alternative, meet the requirements of FMVSS 302 or equivalent.		P
	NOTE It is not necessary to test components that are inherently resistant to ignition, e.g. steel frame tube.		P
9.5.4	Power and control systems	Considered	P
	a) The manufacturer shall adopt appropriate means to eliminate or reduce as far as reasonably practicable the risk of a hazardous situation developing from the ignition of any part of the power and control system of the wheelchair. The manufacturer shall use the process specified in EN ISO 14971:2012 to manage that risk.		P
	b) The power and control system of the wheelchair shall meet the requirements of ISO 7176-14:2008, 9.7, resistance to ignition.		P
10	Propulsion and braking systems		P
10.1	Means for operating brakes		P
10.1.1	Requirement		P

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Clause	Requirement - Test	Result - Remark	Verdict
	a) Means for operating brakes shall: 1) be accessible and operable by the occupant or an assistant or both in accordance with the manufacturer's intended use of the wheelchair; 2) be within the reach space shown in Figure 1, if the wheelchair is intended to be operated by the occupant;		P
	3) be within the reach space shown in Figure 3, if the wheelchair is intended to be operated solely by an assistant; 4) have operating forces for engaging and disengaging that do not exceed those stated in Table 1 when tested in accordance with 10.1.2; NOTE The brake lever type shown in Figure 4 has a whole hand operation.		P
	b) If one or more brake levers are fitted to a wheelchair in the form used on bicycles and mopeds:		N
	1) for wheelchairs with a maximum occupant mass not greater than 150 kg, the force applied to each lever to hold the loaded wheelchair stationary on the rated slope shall not exceed 60 N;		N
	2) for wheelchairs with a maximum occupant mass greater than 150 kg, the force applied to each lever to hold the loaded wheelchair stationary on the rated slope should not exceed 60 N;		--
	3) the handgrip width of such brake levers when no force is applied, measured 15 mm from the end of the brake lever, shall not be greater than 100 mm and should not be greater than 80 mm (see Figure 4).	90mm	P
	c) Means for releasing parking brakes shall be protected against activation caused by accidental contact.		P
10.1.2	Test for determination of brake operating forces		--
10.2	Braking functions	Considered	P
10.2.1	Requirements		P
	a) The wheelchair shall have a running brake which operates independently of tyre wear and tyre inflation pressure and which does not exceed the maximum stopping distance specified in Table 2 when tested in accordance with 10.2.2.1.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	b) The wheelchair shall have a running brake which, when operated after the wheelchair has been put into freewheel mode, shall bring the wheelchair to a stop.		P
	NOTE 1 This requirement could be met by a brake which operates when freewheel mode is ended, if that brake provides the required function. The accessibility requirements in 10.3 would apply. See also NOTE 3.		P
	NOTE 2 The maximum stopping distances of Table 2 do not apply for a running brake operated after the wheelchair has been put into freewheel mode.		P
	c) The wheelchair shall have an automatic brake, which operates independently of tyre wear and tyre inflation pressure and which is operated by releasing the control device to achieve a zero speed command (e.g. spring loaded disc brake).		P
	d) The wheelchair shall have a parking brake which operates independently of tyre wear and tyre inflation pressure (e.g. drum brake in wheels, spring loaded disc brake).		P
	e) Parking brakes shall meet the parking brake effectiveness requirement in Table 1 when tested in accordance with 10.2.2.2.		P
	f) Parking brakes shall be operable when there is no power from the battery supplying the drive system.		P
	g) Parking brakes shall be operable when the wheelchair is in freewheel mode (see NOTE 1).		P
	h) If they are subject to wear, parking brakes shall have provision for adjustment and/or replacement asspecified by the manufacturer.		P
	i) If the wheelchair is fitted with arm supports that can be moved or removed to enable transfer, when tested in accordance with 10.2.2.3, engaged parking brakes shall not have parts that protrude above the level of the occupied seat.		P
	j) When parking brakes are tested in accordance with 10.2.2.4, no parking brake mechanism shall move from the pre-set position and no component or assembly of parts shall show visible signs of cracks, breakages, gross deformations, free play, loss of adjustment or any other damage that adversely affects the function of the wheelchair.		P
			P

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Clause	Requirement - Test	Result - Remark	Verdict
	k) Following testing of the parking brake in accordance with 10.2.2.4, parking brakes shall meet the parking brake effectiveness requirement in Table 1 when tested again in accordance with 10.2.2.2.		P
	NOTE 3 Braking functions can be combined in one device, for example a spring-loaded disc brake could combine automatic brake and parking brake, and could also act as a running brake when exiting freewheel mode.		P
	NOTE 4 The wheelchair might be subject to national requirements for brakes.		P
10.2.2	Test methods		--
10.2.2.1	Test for determination of the effectiveness of running brakes		--
	Perform the tests for normal, reverse command and emergency operation specified in 7.3, 7.4 and 7.5 of ISO 7176-3:2012 using the loaded wheelchair on the horizontal and on the steepest slope specified in ISO 7176-3:2012 less than or equal to the rated slope. The wheelchair fails the requirement if the maximum stopping distance specified in Table 2 of this European Standard is exceeded on the horizontal, or if the wheelchair fails to stop on the test slope.		--
10.2.2.2	Test for determination of effectiveness of parking brakes		--
	a) Adjust the parking brake in accordance with the manufacturer's instructions without exceeding the operating force requirements stated in Table 1.		--
	b) Test the loaded wheelchair facing uphill in accordance with ISO 7176-3:2012, with the test plane inclined to the horizontal at the applicable angle stated in Table 1 for the type class of the wheelchair or at the rated slope specified by the manufacturer, whichever is greater.		--
	c) Repeat b) with the wheelchair facing downhill. d) Determine whether the parking brake holds the loaded wheelchair stationary on the slope.		--
10.2.2.3	Test for protrusion of parts of the parking brakes		--

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Clause	Requirement - Test	Result - Remark	Verdict
	a) Engage the parking brake. b) Move or remove the arm support to enable transfer. c) Check whether any part of the parking brake protrudes above the level of the occupied seat.		--
10.2.2.3	Test for protrusion of parts of the parking brakes		--
	a) Engage the parking brake. b) Move or remove the arm support to enable transfer. c) Check whether any part of the parking brake protrudes above the level of the occupied seat.		--
10.2.2.4	Test method for fatigue strength of parking brakes		--
	a) Carry out the test with the parking brake mounted on the wheelchair or mounted on a suitable test fixture that simulates mounting on the wheelchair. If the wheelchair is fitted with two identical brakes (left and right), test only one of the brakes.		--
	b) Adjust the parking brake in accordance with the manufacturer's instructions without exceeding the operating force requirements stated in Table 1.		--
	c) Move the lever operating the brake smoothly from the non-braking position to the braking position for 60 000 cycles at a frequency not greater than 0,5 Hz (4.12). Carry out maintenance during testing only in accordance with the manufacturer's instructions.		--
	d) Inspect the brake mechanism and determine whether it has met the requirement. e) If a test fixture was used, return the brake mechanism to the wheelchair.		--
10.3	Freewheel device	Considered	P
	The wheelchair shall be fitted with a freewheel device that shall — be accessible and operable by the occupant or an assistant or both in accordance with the manufacturer's intended use of the wheelchair,		P
	— be within the reach space shown in Figure 1, if the wheelchair is intended to be operated by the occupant,		P

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Clause	Requirement - Test	Result - Remark	Verdict
	— be within the reach space shown in Figure 3, if the wheelchair is intended to be operated solely by an assistant;		P
	— have operating forces for engaging and disengaging that do not exceed those stated in Table 1,		P
	— be operable without detaching any parts,		P
	— not depend on the battery power supplying the motor drive system,		P
	— have two defined positions including clear indication of freewheel mode and drive mode,		P
	— prevent use of the wheelchair's drive system, if the freewheel device is activated.		P
	A battery independent from the motor drive battery may be used to supply energy to enable freewheel mode.		P
	NOTE 1 An audible alarm activated when the freewheel device is in operation and deactivated when the drive and braking systems are fully operational would assist the occupant and/or assistant.		P
	Freewheel devices shall be protected against activation caused by accidental contact.		P
11	Operations	Considered	P
11.1	Operations intended to be carried out by the occupant and/or assistant		P
	Wheelchairs shall be designed to facilitate ease of operation by the occupant and/or assistant as specified in the manufacturer's instructions.		P
	— operation of adjustable seating and adjustment of postural supports,		P
	— use of detachable components, including removable arm supports, lower leg support assemblies, etc., to facilitate safe transfers into and out of the wheelchair,		P
	— use of folding mechanisms, including folding frames, etc., to facilitate storage and transportation of unoccupied wheelchairs,		P
	— carrying out maintenance, including use of tools, etc.,		P
	— use of manual steering controls,		P
	— use of braking systems and freewheel devices,		P

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Clause	Requirement - Test	Result - Remark	Verdict
	— use of assistant controls,		P
	— use of control devices.		P
11.2	Controls intended for operation by the occupant	Considered	P
	Controls intended to be operated by the occupant while seated shall be within the occupant reach space shown in Figure 1.		P
	The following controls, if fitted, are included: — on/off switch or key, — speed regulator, — speed pre-setting, — running brake, — parking brake, — audible warning device, — direction indicator,		P
	— direction switch, — control device, — manual steering controls, — lighting controls, — seating adjustments,		P
	— detachable components, including removable arm supports, lower leg support assemblies, etc., to facilitate safe transfers into and out of the wheelchair, — steering controls, — freewheel device.		P
11.3	Controls intended for operation by an assistant		P
	Controls intended to be operated by an assistant shall be within the reach space shown in Figure 3. Examples include: — brakes, — control devices, — push handles, and — electrical ancillary equipment.		P
11.4	Assistant control unit, push handles and handgrips	Considered	P
11.4.1	Requirements		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Switches intended to be operated by an assistant while driving the wheelchair shall be attached to an assistant control unit.		P
	When an assistant control unit is fitted, — the unit shall be positioned behind the wheelchair's back support, between 900 mm and 1 200 mm from the floor to the centre of the operating means for the control device (e.g. joystick handle), and — there shall be a means to support the assistant's hand or hands used to operate the control device.		P
	When push handles are fitted, no part of the wheelchair shall lie within a space to the rear of the wheelchair bounded by the following: — a plane at 85° to the horizontal, that touches the rearmost points of the push handles as shown in Figure 6; — two planes not less than 350 mm apart equidistant from a vertical plane parallel to the forward direction of travel that bisects the wheelchair, unless the intended occupant is a child; — the horizontal test plane.		P
	When the wheelchair is fitted with steering and/or manoeuvring handgrips for use by an assistant, the handgrips shall be at least 75 mm in length and between 20 mm and 50 mm in diameter.		P
	When manoeuvring handgrips are fitted with controls that are intended to be used by being gripped by one hand, the handgrip width when no force is applied shall not be greater than 100 mm and should not be greater than 80 mm (see Figure 4).		P
11.4.2	Test method		--
11.5	Operating forces		P
11.5.1	Requirements		P
	All controls, except for means to operate brakes, shall have operating forces for engaging and releasing that do not exceed those stated in Table 1 when tested in accordance with 11.5.2.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	NOTE Requirements and test methods for means to operate brakes are given in 10.1. In addition, to achieve the intended function of the system or device being operated, for knobs intended to be gripped and turned by one hand		P
	— where the diameter of the knob is greater than or equal to 25 mm and the force is transmitted by friction, the numerical value of the torque, expressed in Nm, shall not be greater than 0,05 times the numerical value of the diameter of the knob, expressed in mm,		P
	where the diameter of the knob is less than 25 mm diameter, the numerical value of the torque, expressed in Nm, shall not be greater than 0,025 times the numerical value of the diameter of knob, expressed in mm.		P
11.6	Seating adjustments for tilt and recline systems		P
11.6.1	Requirements		P
	If the manufacturer specifies that the seating can be adjusted by an assistant or the occupant or both while the occupant is seated, the assistant and/or the occupant shall not have to lift a mass (e.g. the combined mass of the occupant and the seating) which presents a moving and handling safety hazard to the assistant and/or the occupant.		P
	Controls for seating adjustments intended to be operated by the occupant shall be accessible to the occupant from all seating positions.		P
	NOTE The lighter shaded region of Figure 1 shows the reach space for the occup		P
12	Electrical systems		P
12.1	General requirements		P
	The wheelchair shall conform to the requirements of ISO 7176-14:2008, except as specified in 9.5.4. The wheelchair and battery charger shall conform to the requirements of ISO 7176-21:2009. In addition, wheelchairs that include an on-board battery charger shall conform to the applicable electrical requirements of EN 60601-1:2006.		P
12.2	Circuit protection		P
	The driving, braking and steering functions shall not be affected by the operation of the means of protection of any other circuit.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Lights, direction indicators and hazard warning flasher functions shall not be affected by the operation of the means of protection of any other circuit.		P
12.3	Battery chargers		P
	Battery chargers for wheelchairs shall conform to the requirements of ISO 7176-14:1997 that apply to battery chargers, together with the following provisions:		P
	a) battery chargers shall indicate when charging is in progress and when charging is complete; b) battery chargers shall have the capability of charging batteries discharged to 70 % of their nominal voltage;		P
	c) battery chargers shall operate without the need for intervention or supervision apart from connecting and turning on at the start of charging and turning off and disconnecting at the end of charging; d) carry-on and on-board battery chargers shall meet the environmental protection requirements of IPX4 when tested in accordance with EN 60529:1991 and shall meet the Class II Test Voltage requirements of EN 60335-1:2012 following the test.		P
12.4	Charging connector		P
	The wheelchair shall have a charging connector that is readily accessible and operable by the occupant or an assistant or both in accordance with the manufacturer's intended use of the wheelchair.		P
	NOTE The shape and position of the charging connector are important factors contributing to the ease and safety of operation.		P
	The requirement is verified by inspection.		P
12.5	Battery enclosures and containers		P
	Battery enclosures and containers shall provide protection so that it should not be possible for liquids dropping from above to enter into them and onto any cell or battery they contain.		P
12.6	Emergency stop		P
	The wheelchair shall be fitted with one or more emergency stop devices to enable actual or impending danger to be averted.		P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	Each emergency stop device shall: — be clearly identifiable, clearly visible and quickly accessible by the intended operator, and — stop the hazardous process as quickly as practicable, without creating additional risks.		P
	Once active operation of the emergency stop device has ceased following a stop command, that command shall be sustained by the wheelchair until that engagement is specifically overridden. It shall not be possible to engage the device without triggering a stop command. It shall be possible to disengage the device only by an appropriate operation, and disengaging the device shall not restart the wheelchair but only permit restarting.		P
	The emergency stop function shall be available and operational at all times, regardless of the operating mode.		P
	Emergency stop devices shall be a back-up to other safeguarding measures and not a substitute for them.		P
	NOTE An on/off switch establishes an emergency stop device for all related input devices located nearby (within the same enclosure), e.g. joystick and on/off button located on the same control module.		P
	Additional emergency stop devices may be attached to a wheelchair to be operated by an assistant. Where the intended occupant has an impairment which restricts their ability to operate an emergency stop device, the risk assessment should take this into account.		P
12.7	Lighting		P
	Wheelchairs intended by the manufacturer for outdoor use shall be supplied with integral lighting suitable for the operations concerned where the absence thereof is likely to cause a risk despite ambient lighting of normal intensity.		P
	Wheelchairs might be subject to national requirements for lighting and reflectors.		P
	If there are no national requirements, the manufacturer should conform to applicable automotive Directives of the European Union (76/756/EEC [12], 97/28/EC [13]).		P
12.8	Switching off while driving		P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	If the wheelchair is switched off while driving on the horizontal, it shall come to a stop within the maximum stopping distances specified in Table 2.		P
12.9	Software		P
	Software that is embedded in the wheelchair or is an integral part of the wheelchair, and the malfunction of which could give rise to a hazardous situation, shall be developed and maintained in accordance with EN 62304:2006.		P
	This requirement does not apply to software produced before the date of withdrawal of EN 12184:2009, but it does apply to software modifications that are made after that date.		P
13	Information supplied by the manufacturer		P
13.1	General		P
	Each wheelchair shall be provided with documentation and labelling that conform to the requirements in EN 12182 and ISO 7176-15:1996.		P
	In addition, the manufacturer shall provide the documentation in three separate sections: pre-sale, user and service information as specified in 13.2, 13.3 and 13.4. These may be provided as separate printed documents or in other forms of media to meet the needs of individual occupants or their assistants.		P
	For the requirements in 13.2 and 13.3, unless otherwise specified, all linear dimensions shall be expressed in millimetres and all masses shall be expressed in kilograms.		P
	In addition to the requirements of 13.1, pre-sale information shall include the following: a) information on how to obtain the user information in a format appropriate for use by visually impaired people;		P
	b) a description of the intended occupant of the wheelchair, including the occupant's mass and any specific requirements for the occupant's functional capability, visual ability and cognitive ability suitable for operating the wheelchair safely in its intended environment;		P
	c) the intended operator (occupant, assistant or both);		P
	d) a description of the intended use and the intended environment;		P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	e) the type class of the wheelchair: Class A, Class B or Class C;		P
	f) the overall dimensions (width, length and height) of the wheelchair and its mass when it is ready for use and, if applicable, when it is folded or dismantled;		P
	g) if the overall dimensions of the wheelchair when it is ready for use exceed the values recommended in A.1.1, a clear statement that the wheelchair is larger than the recommended dimensions;		P
	h) the minimum width of corridor in which the wheelchair can be turned to face the opposite direction; NOTE The applicable measurement for wheelchairs with full differential steering is the pivot width, while for wheelchairs with limited differential steering or direct steering, it is the reversing width. See A.2.2.		P
	i) the rated slope, expressed in degrees;		P
	j) the standard options that are available for the wheelchair;		P
	k) the type(s) of tyres that can be used on the wheelchair;		P
	l) operator adjustments;		P
	m) if the wheelchair can be dismantled or has any removable parts, the mass of the heaviest part;		P
	n) information concerning whether the removal of parts or accessories intended by the manufacturer to be removed without the use of tools will have adverse or beneficial effects on the wheelchair;		P
	o) information on whether or not the wheelchair is intended to be used as a seat in a motor vehicle, and whether and how this depends on the standard options referred to in j);		P
	p) information on whether the unoccupied wheelchair is suitable for land and/or air transport;		P
	q) the theoretical continuous driving distance range, expressed in kilometres, that the wheelchair can travel under its own power on the horizontal when tested in accordance with ISO 7176-4:2008, with the addition of a note explaining that the distance will be reduced if the wheelchair is used frequently on slopes, rough ground or to climb kerbs, etc.;		P
			P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	This additional requirement may be reduced to some degree if an accurate charge level indicator is fitted.		P
	r) the maximum height of kerb which the wheelchair can descend safely;		P
	s) if a programmable controller is fitted, information on the method of programming, the competency required to carry out the programming and the effects it can have on driving performance.		P
	User information shall be provided by the manufacturer with each wheelchair. Further copies shall also be available for any subsequent user of the wheelchair. User information shall contain all pre-sale information and the following:		P
	a) the unique identification number of the wheelchair or information on the location of the unique identification number on the wheelchair;		P
	b) any adjustment or settings required before the wheelchair can be used and warnings of how adjustments or settings affect stability;		P
	c) where applicable, information on any adjustments that can be made and the competency required to carry out these adjustments;		P
	d) instructions on operation of all controls, including brakes;		P
	e) instructions on how to engage and disengage the drive system;		P
	f) the wheelchair manufacturer's recommended tyre pressure(s), expressed in kPa, bar or PSI;		P
	g) instructions for dealing with tyre punctures, where pneumatic tyres are fitted;		P
	h) the battery type and nominal voltage;		P
	i) instructions for battery maintenance;		P
	j) instructions for operating the battery charger, including warnings regarding any potential safety hazards (e.g. a possibility of gas accumulating in the charging area, use of the wrong type of battery charger);		P
	k) if required by the risk analysis, instructions for fitting an additional emergency stop device where the intended occupant has an impairment which could restrict their ability to operate one;		P
	l) instructions on whether and how the wheelchair can be folded to assist in storage or transport;		P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	m) instructions on dismantling and re-assembly of the wheelchair or any removable parts;		P
	n) instructions regarding transport of the wheelchair when it is unoccupied (e.g. in a car or aeroplane);		P
	o) the masses of parts of the wheelchair that are expected to be handled during dismantling, reassembly, or carrying;		P
	p) the positions of points where the component parts can be gripped for safe moving and handling and/or a method for handling during dismantling, assembly or carrying;		P
	q) if the manufacturer specifies that the wheelchair is intended for use as a seat in a motor vehicle, the method of attaching wheelchair tiedown and occupant restraints, and recommendations about suitable tiedown and restraint systems;		P
	r) if the manufacturer specifies that the wheelchair is not intended for use in the motor vehicle, a warning to that effect, together with the symbol shown in Figure 7;		P
	s) instructions on how to obtain and fit the optional anterior pelvic support (see 9.4) if it is not supplied with the wheelchair;		P
	t) the positions of points intended to carry additional loads;		P
	u) instructions for preparing the wheelchair for long-term storage (e.g. longer than four months) and for preparing it for use afterward;		P
	v) a warning that the wheelchair might disturb the operation of devices in its environment that emit electromagnetic fields (e.g. alarm systems of shops, automatic doors, etc.);		P
	w) a warning that the driving performance of the wheelchair can be influenced by electromagnetic fields (e.g. those emitted by portable telephones, electricity generators or high power sources);		P
	x) a warning that the stopping distance on slopes can be significantly greater than on level ground;		P
	y) a warning that surface temperatures can increase when exposed to external sources of heat (e.g.sunlight);		P
	z) a warning for trapping hazards (e.g. pinch points);		P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	aa) a warning if driving characteristics can be adjusted outside the limits specified in Table 1 and Table 2;		P
	bb) a warning if the adjustments of seating or wheel positions can be set outside safe limits;		P
	cc) if the overall width or overall length of the wheelchair when it is ready for use exceed the applicable values recommended in A.1.1, a warning concerning access to emergency escape routes;		P
	dd) the level of resistance to ignition of materials and assemblies;		P
	ee) information on the recycling of used batteries and of the wheelchair;		P
	ff) if the characteristics of the wheelchair (including occupant as applicable) exceed the limits specified in Annex M of the Technical Specification for Interoperability relating to Accessibility for Persons with Reduced Mobility (PRM-TSI), a statement to that effect (see Annex D);		P
	gg) information on how to find out about product safety notices and product recalls, for example by ensuring the supplier has up-to-date contact information;		P
	hh) the expected service life of the wheelchair;		P
	ii) the name and address of the manufacturer;		P
	jj) the name and address of the authorised representative, where the manufacturer does not have a registered place of business in the European Union.		P
13.4	Service information		P
	The service information shall contain all the pre-sale information, user information and instructions necessary for the maintenance, adjustment and repair of the wheelchair and for the replacement of parts.		P
13.5	Labelling		P
	n addition to the requirements of 13.1, the manufacturer shall apply permanent labelling for the following: a) devices for disengagement of the drive system, showing engaged and disengaged positions, including a warning that the drive system should be re-engaged before an occupant is left unattended or attempts to operate the wheelchair;		P

EN 12184:2014			
Clause	Requirement - Test	Result - Remark	Verdict
	b) for wheelchairs where the intended use includes use as a seat in a motor vehicle, the position of attachment points for wheelchair tie-down and occupant restraint systems (WTORS);		P
	c) for wheelchairs not intended to be used as a seat in a motor vehicle, a warning to that effect, including the symbol shown in Figure 7 with a diameter not less than 15 mm, in the same location as the labelling required by ISO 7176-15:1996;		P
	d) for battery chargers that are not on-board chargers, information and connection details specified in Clause 9 of ISO 7176-14:1997;		P
	e) for Class A wheelchairs not intended for use outdoors, a warning to that effect.		P

Photo Documentation

PHOTO 1

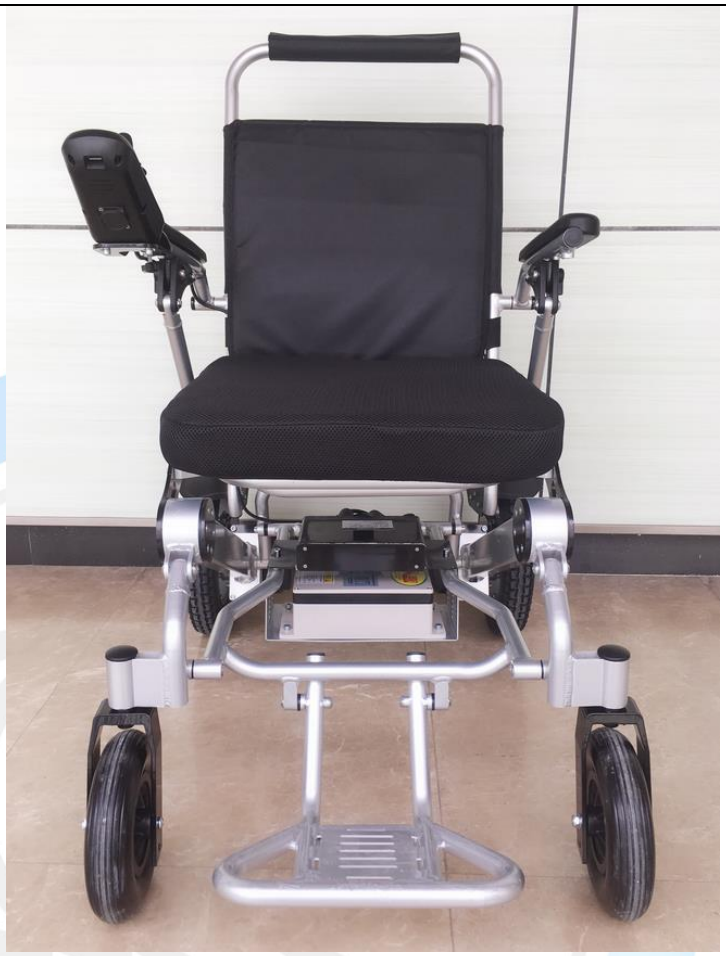


PHOTO 2

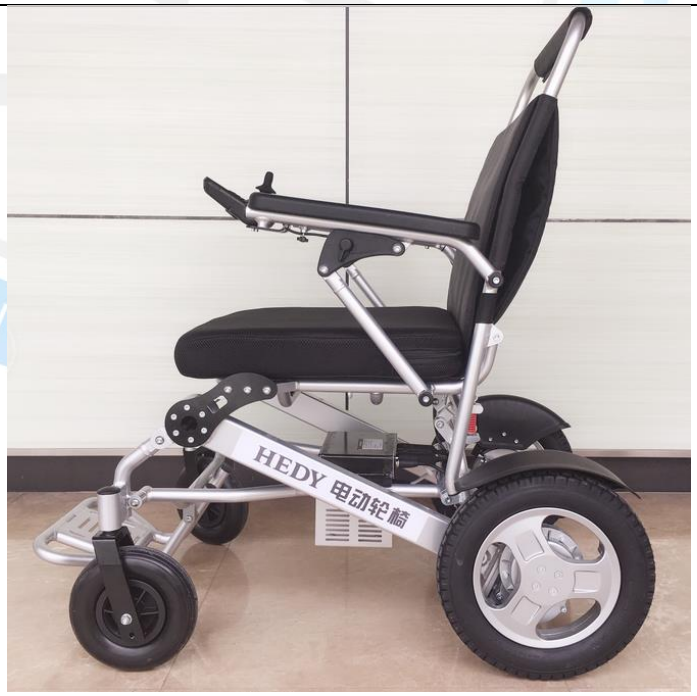
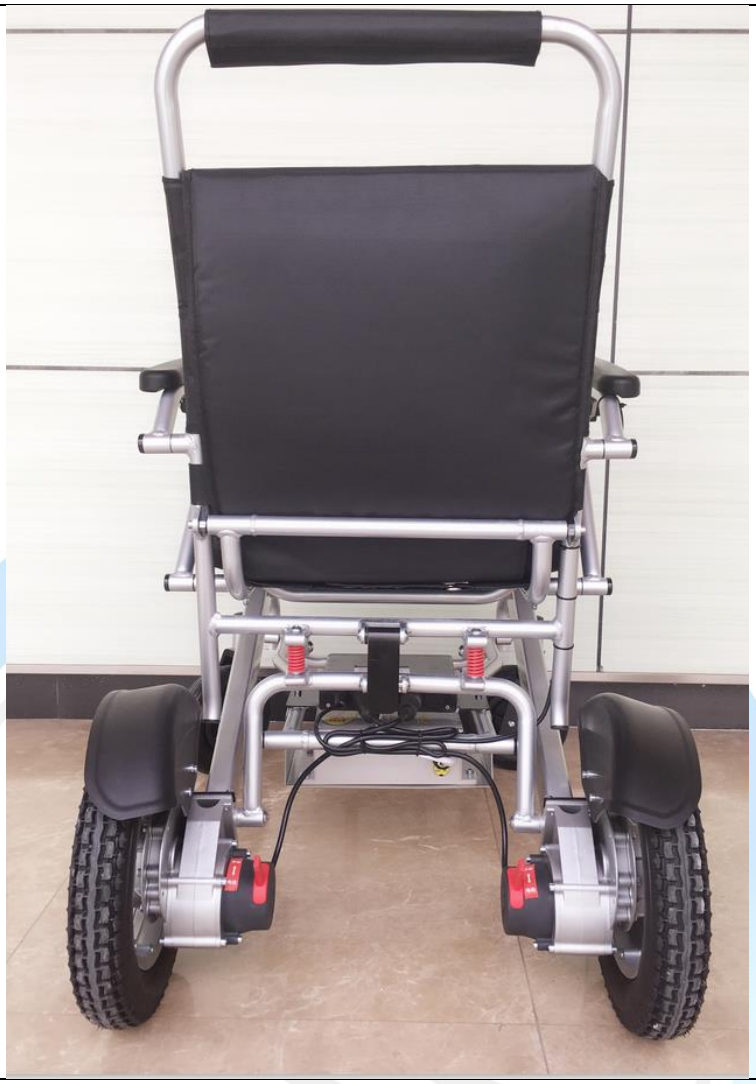


PHOTO 3



***** End of Report *****