

TEST REPORT EN 12184 Electrically powered wheelchairs, scooters and their chargers – Requirements and test methods	
Report Reference No.	4939190.50
Tested by (name + signature)	Red Gong / Project Engineer 
Reviewed by (name + signature)	Aaron Cen / Reviewer 
Date of issue	2025-12-19
Testing Laboratory	DEKRA Testing and Certification (Shanghai) Ltd., Guangzhou branch
Testing location / address	Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China
Applicant	XSTO CO., LTD.
Address	Floor 9, Building No.1, Cuiheng Technology Interlligent Hub, No.1 Heji Street, Cuiheng New District, Zhongshan City, Guangdong, China
Test specification:	
Standard(s)	EN 12184:2022
Test procedure	Type test
Test object description : Powered wheelchair (Mobility robot)	
Trade Mark	
Manufacturer	Same as applicant
Factory	Same as applicant
Model/Type reference	XSTO M4 Pro
Ratings	Charger Input: AC 100-240 V; 50/60Hz; 2,5A Max. Charger Output: DC 29,4V; 4,0A; 117,6W Wheelchair: DC 29,4V; IPX4 Internal Battery: DC 25,2V; 23,8Ah; 599,76Wh
Classification of installation and use.....	Mobile equipment
Testing:	
Date of receipt of test item	2025-08-08
Date (s) of performance of tests	2025-08-08 to 2025-12-15
The mass of the dummy or human test occupant and weights used.....	150Kg



Test item particulars	Powered wheelchair
Type classes	Class B
Type and model of motors	See "General product information"
Type and capacity of the batteries	See "General product information"
Type and model of Charger	See "General product information"

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)
- test object was not evaluated for the requirement : N/E

Summary of testing:

Tests according to the following standard was carried out:

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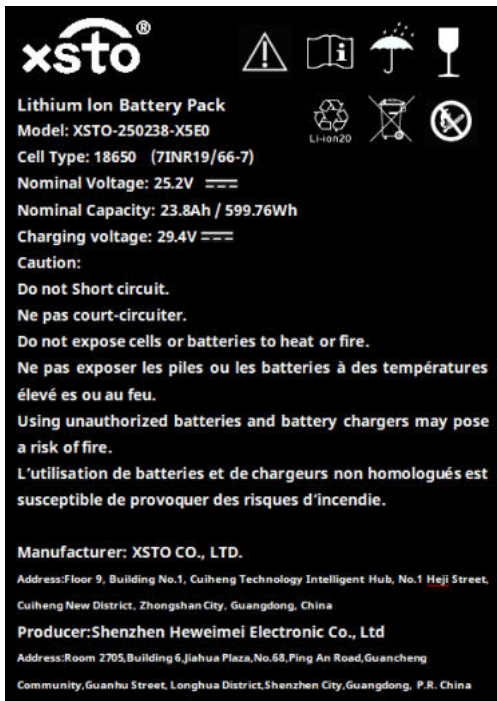
The submitted samples fulfilled the requirements of specified standard except for Clause 6.6 Biocompatibility and toxicity, EMC part in Clause 12.1, 12.3, Clause 12.9 Software.

Tests were carried out with a test dummy conforming to ISO 7176-11:2012, on a test platform whose surface friction coefficient complies with ISO 7176-13:1989.

Summary of compliance with National Differences (List of countries addressed):

None

Copy of marking plate: The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs or NBs that own these marks.



Label on battery pack



Label on wheelchair



Label on charger

General remarks:

The tests results presented in this report relate only to the object tested.

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

List of test equipment must be kept on file and available for review.

Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Additional test data and/or information provided in the attachments to this report.

Throughout this report a comma is used as the decimal separator.

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General product information:

The Powered wheelchair (mobility robot) is a motor driven transportation vehicle with the intended use to provide mobility for both indoor and outdoor use to a disabled or elderly person limited to a seated position and it is suitable for use by people with mobility difficulties in medical institutions or home settings.

Specification sheet

Class	B
Max. Weight Capacity / The mass of the test dummy	150kg
Base weight	61kg
Base weight (not including battery)	58kg
Max. Speed, forwards on horizontal	6km/h
Cruising range (km)	26 km
Size L×W×H (mm)	Unfold: 1020 mm×592 mm×1120mm Fold: 1040 mm×592 mm×615 mm
Effective seat depth	Min: 450 mm, Max: 560 mm
Effective seat width	Min: 390 mm, Max: 550 mm
Backrest angle	Min:90°, Max:135°
Backrest height	589 mm
Footrest-to-seat distance	Min:261mm, Max: 534mm
Leg-to-seat-surface angle	100°
Armrest-to-seat distance	Min: 255mm; Max: 312mm
Horizontal location of axle	119mm
Liquid protection level	IPX4

Battery type	Lithium-ion Battery Pack Model: XSTO-250238-X5E0 Ratings: 25,2Vdc; 23,8Ah; 599,76Wh Weight: 3,2kg Module size: 745mm x 580mm x 350mm Manufacturer: XSTO CO., LTD. Manufactured by Shenzhen Heweimei Electronic Co., Ltd
Battery charger	Model: XVE126-2940400 Input: AC 100-240V; 50/60Hz; 2,5A; Max. Output: 29,4Vdc; 4,0A; 117,6W Manufactured by JIN XIN YU POWER (SHENZHEN) SUPPLY CO., LTD
Motor type	Model: SYM12-A3-1-R Ratings: DC 24 V; Class H Manufactured by Zhejiang Shiyou Drive Technology Co., LTD
Maximum stability angle	15°
Max Climbing Angle	15°
Safe Gradient/Maximum Gradient	15°
Tires type	2 x 10 inches for front wheel (solid tire, omnidirectional wheel) 2 x 10 inches for rear wheel (solid tire)
Pedal assembly size	312 mm x 220 mm
Service life (Year)	4
Operating environment	5°C to 40°C; R.H.: < 95%; Altitude: ≤ 2000m
Storage and Transport environment	0°C to 35°C; R.H.: < 95%; Altitude: ≤ 2000m
Audible noise	< 70dB

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Clause	Requirement	Remarks	Verdict

5	Type classes		P
	Wheelchairs shall be classified in one or more of the following three classes, dependent upon their intended use:		P
	Class A: wheelchairs intended for driving on flat horizontal surfaces and gentle slopes;		N/A
	Class B: wheelchairs intended for driving on moderately uneven surfaces and on moderate slopes, in addition to the intended use described for Class A;		P
	Class C: wheelchairs intended for driving on uneven terrain and on steeper slopes, in addition to the intended uses described for Classes A and B.		N/A
6	General requirements		P
6.1	Risk management		P
	A risk management process shall be performed in accordance with EN ISO 14971:20195. For conformity with this document, all elements of the risk management process specified in EN ISO 14971:20195 shall be applied except:		P
	— the planning for, and execution of, production and post-production monitoring (EN ISO 14971:20195, 4.1 fourth indent, 4.4 item g) and Clause 10); and		P
	— periodic reviews of the suitability of the risk management process (EN ISO 14971:20195, 4.2 third paragraph).		P
6.2	Intended performance and technical documentation		P
	a) The wheelchair shall have sufficient strength and durability to sustain all loads expected during intended use. This shall be confirmed by using, where appropriate, references to relevant clinical and scientific literature, strength and/or durability calculations, appropriate test standards and their test results, in addition to the requirements given in this document.		P
	b) The intended performance of the wheelchair, including, where appropriate, strength, durability and tipping stability, shall be described in technical documentation which sets out its functional characteristics, its application(s) and conditions of use.		P
	c) The technical documentation shall include, where appropriate, references to relevant clinical and scientific literature, any strength and/or life calculations, appropriate test standards and their test results.		P
6.3	Clinical evaluation and investigation		P

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Clause	Requirement	Remarks	Verdict
	A clinical evaluation shall be conducted for the wheelchair.		P
	If, as part of the product conformity assessment, the clinical evaluation requires a clinical investigation, the clinical investigation shall conform to the requirements of EN ISO 14155:2020. A clinical evaluation shall always be conducted before performing a clinical investigation.		P
6.4	Wheelchairs that can be dismantled		P
	If it is intended that the wheelchair can be dismantled for storage or transportation, it shall not be possible to reassemble the wheelchair in a manner that presents a hazard.		P
6.5	single-use fasteners		N/A
	If it is intended that the wheelchair can be dismantled for storage or transportation, the fasteners which are loosened or removed to allow this dismantling shall not be single-use fasteners.		N/A
6.6	Biocompatibility and toxicity		N/E
	Materials which come into contact with the human body shall be evaluated for biocompatibility in accordance with EN ISO 10993-1:2020 as part of the risk management process (see 6.1).		N/E
	The evaluation shall take into account the intended use, including, where appropriate, contact with the occupant, an assistant, those involved in care of the occupant, and those involved in transportation and storage of the wheelchair.		N/E
	Wheelchairs shall be designed and manufactured to minimize the risks posed by substances leaking from them. Special attention shall be given to substances which are carcinogenic, mutagenic or toxic to reproduction and other substances of very high concern (SVHCs). The evaluation should follow the guidance given in Annex F.		N/E
6.7	Contaminants and residues		P
6.7.1	General		P
	The requirements given in 6.7.2 apply to substances which are an integral part of the wheelchair or are necessary for its function, such as oil and grease.		P
	The requirements do not apply to body fluids which the wheelchair is intended to collect (e.g. as a stoma-care product).	No such part	N/A
6.7.2	Substances which can leak in intended use or in a fault condition		N/A

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Clause	Requirement	Remarks	Verdict

	Where a substance can leak from the wheelchair in intended use or in a fault condition:		N/A
	a) the substance shall be assessed for biocompatibility in accordance with EN ISO 10993-1:2020 as part of the risk management process, and the assessment shall consider intended use, including, where appropriate, contact with the occupant, an assistant, those involved in care of the occupant, and those involved in transportation and storage of the wheelchair; or	No such leak	N/A
	b) the wheelchair shall have means of protection that minimizes the possibility of the substance becoming a biological hazard.		N/A
6.8	Infection and microbiological contamination		P
6.8.1	Cleaning and disinfection		P
	If any parts of the wheelchair are intended to be cleaned, the method and suitable materials for cleaning shall be described in the instructions for use.		P
	If any parts of the wheelchair are intended to be disinfected, the method and suitable materials for disinfection shall be described in the instructions for use.	No such part	N/A
	If any parts of the wheelchair are intended to be cleaned by automatic washing systems or hand-held jet stream or steam washing, the details of the procedure, such as temperature, pressure, flow and pH value of cleaning/rinsing solution, shall be described in the instructions for use.	No such part	N/A
	Where practicable, the wheelchair shall be labelled with appropriate symbols to represent the method of cleaning.		N/A
6.8.2	Animal tissue		N/A
	Where the wheelchair has been manufactured utilizing tissues of animal origin or their derivatives, the process specified in EN ISO 22442-1:2020 shall be followed as part of the risk management process (see 6.1).	Not such wheelchair	N/A
6.9	Overflow, spillage, leakage and ingress of liquids		P
6.9.1	Overflow		N/A
	If the wheelchair incorporates a reservoir or liquid storage chamber that can be overfilled or can overflow in intended use, liquid overflowing from the reservoir or chamber shall not wet electrical insulation or live parts which are liable to be adversely affected by such a liquid, nor shall a hazard be created.	Not such wheelchair	N/A

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Clause	Requirement	Remarks	Verdict
	Unless indicated by a marking or by the instructions for use, no hazard shall be created if the wheelchair is tilted through an angle 15° greater than the maximum inclination that can occur during intended use.		N/A
6.9.2	Spillage		N/A
	Wheelchairs requiring the handling of liquids in intended use shall be so constructed that spillage does not wet parts that creates a hazard.	Not such wheelchair	N/A
6.9.3	Leakage		N/A
	Wheelchairs shall be so constructed that liquid which can escape in single fault condition does not create a hazard.	Not such wheelchair	N/A
6.9.4	Ingress of liquids		P
	If liquid can enter an enclosure unintentionally, either there shall be a means for the liquid to escape from the enclosure, or the liquid shall not create a hazard.	IPX4	P
6.10	Safety of moving parts		P
6.10.1	Squeezing		P
	Unless the intended purpose of part of the wheelchair is to grip, cut, squeeze or provide a similar function, or if the intended use cannot be achieved without a risk of squeezing:		—
	a) any moving parts that constitute a hazard shall be provided with guards that cannot be removed without the use of a tool; or		P
	b) the gap between exposed parts of the wheelchair that move relative to each other shall be maintained throughout the range of movement at less than the relevant minimum value or more than the relevant maximum value specified in Table 1; or		N/A
	c) if cords (ropes), chains or drive belts are used, either they shall be confined so that they cannot run off or jump out of their guiding devices, or a hazardous situation shall be prevented by other means; mechanical means used for this purpose shall not be removable without the use of a tool; or	No such part	N/A
	d) the wheelchair shall incorporate a control device which enables the movement when it is operated and stops the movement when it is released (e.g. a spring-loaded device that returns to the stop position when released); or		P
	e) the wheelchair shall incorporate means to detect that a person is in danger of being trapped and to prevent injury automatically (e.g. by stopping the movement).		N/A

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Clause	Requirement	Remarks	Verdict

	For moving parts that can cause squeezing, manufacturers shall take into consideration the part or parts of the body that are at risk.		P
	It is necessary to specify the characteristics of the persons involved in the intended use, so that the appropriate safe distances can be applied.		P
6.10.2	Mechanical wear		P
	Parts subject to mechanical wear likely to create a hazard shall be accessible for inspection.		P
6.10.3	Emergency stopping functions		P
	The requirements specified in 12.6 shall apply to moving parts of the body support system if there is a risk that the occupant can be squeezed or that a single fault can create a hazard.		P
6.11	Prevention of traps for parts of human body		P
6.11.1	Holes and clearances		P
	Holes in, and clearances between stationary parts that are accessible to the occupant and/or assistant during the intended use of the wheelchair shall be as specified in Table 2.		P
	If the intended purpose of the wheelchair cannot be met without a hazard caused by the size of holes and the clearance between stationary parts, a warning and instructions on how to control the risk shall be provided in the instructions for use.		N/A
	For stationary parts that can cause a trap, manufacturers shall take into consideration the parts of the body that are at risk.		N/A
	It is necessary to specify the characteristics of the persons involved in the intended use, so that the appropriate safe distances can be applied.		P
	The design of parts that confine a hole or clearance shall take into consideration the forces that can be applied in normal use.		P
	The lower limits specified in Table 2 do not apply for holes with the shape of a keyhole, or for V-shaped openings.		N/A
	When inspecting the wheelchair for traps for body parts any flexibility and/or elasticity of adjacent parts shall be taken into account.		P
6.11.2	V-shaped openings		N/A
	The risk of entrapment in V-shaped openings shall be addressed by the risk management process (see 6.1).	No such openings	N/A

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Clause	Requirement	Remarks	Verdict

6.12	Folding and adjusting mechanisms		P
6.12.1	General		P
	Folding and adjusting mechanisms can present a hazard if parts of the body can enter a gap between parts and be trapped when the gap is closed.		P
	If the wheelchair incorporates folding and/or adjusting mechanisms it shall conform to 6.12.2 and 6.12.3.		P
6.12.2	Locking mechanisms		P
	Folding and adjusting mechanisms shall be capable of being securely locked when the wheelchair is in a working configuration.		P
	They shall also be capable of being securely locked when folded if they constitute a risk.		P
	The wheelchair shall fold in a safe manner.		P
6.12.3	Guards		P
	Either:		P
	a) the wheelchair shall incorporate means to protect the occupant from trap and/or squeeze hazards; or		N/A
	b) the gap between exposed parts of the wheelchair that move relative to each other shall be maintained throughout the range of movement at less than the applicable minimum value or more than the applicable maximum value set out in Table 1; or		N/A
	c) if the intended purpose of the wheelchair cannot be met without a hazard such as squeezing, a warning and instructions on how to control the risk shall be provided in the instructions for use.	Warning and instructions provided	P
	The design of a guard shall take into consideration the forces that can be applied in normal use.		P
6.13	Surfaces, corners, edges and protruding parts		P
	If not required for intended use, accessible edges, corners and surfaces of the wheelchair shall be smooth and be free from burrs and sharp edges.		P
	If not required for intended use, wheelchairs shall not have protruding parts.		P
	Where practicable, protruding parts shall have protection to prevent injury and/or damage.		N/A
6.14	Ergonomic principles		P
	Wheelchairs shall be designed in accordance with the ergonomic principles set out in EN 614-1:2006+A1:2009, taking into account the specific needs of the intended occupant.		P

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Clause	Requirement	Remarks	Verdict
	The ergonomic principles set out in EN 614-1:2006+A1:2009 also apply to an assistant, those involved in care of the wheelchair occupant, and those involved in transportation and storage of the wheelchair.		P
	Grips, handles and foot supports shall suit the functional anatomy of the occupant and/or assistant, in accordance with the intended use, and meet the following requirements:		P
	a) the distance between any handle (part intended to be gripped) requiring an operating force of more than 10 N and any other part of the wheelchair shall not be less than 35 mm;		P
	b) the vertical distance between the upper surface of a foot support or pedal in its operating position and any other part of the wheelchair shall not be less than 75 mm;		P
	c) the diameter of any operating handle or knob requiring an operating force of more than 10 N shall be between 19 mm and 43 mm;		P
	d) the upper surface of any pedal intended for operation by an assistant shall not be more than 300 mm above the ground.		P
6.15	General modifications to normative references		P
	For the purposes of this document, the scope of this document supersedes any restrictions in scopes of the normative references listed in Clause 2 concerning maximum speed and maximum occupant mass.		P
6.16	Applicable provisions for specified types of wheelchair		N/A
	Annex G specifies the provisions in this document that apply to some specified types of wheelchair.		N/A
	Wheelchairs of types listed in G.1 shall meet the applicable requirements of Annex G.		N/A
6.17	Recommendations		P
	The following annexes provide recommendations:		P
	— Annex A for dimensions and manoeuvring space;		P
	— Annex B for design features;		P
	— Annex C for lighting and reflectors;		P
	— Annex E for safety in freewheel mode.		P
7	Preparation for testing		P
7.1	General		P
	Unless otherwise specified in Clauses 8, 9, 10, 11 and 12, the wheelchair shall be prepared for testing as specified in ISO 7176-22:2014 with the following modification	See ISO 7176-22 report 4939190.62	P

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Clause	Requirement	Remarks	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		P
	This instruction supersedes instructions for loading the wheelchair in the referenced standards.		P
	If, due to the speed of the wheelchair, the test plane specified in a referenced document is of insufficient size to conduct the specified tests, use the horizontal test plane specified in 4.1 or an inclined test plane specified in 4.2 as applicable.		P
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 0kg to +5kg.	150kg dummy	P
	Fit the test dummy in the wheelchair as specified in ISO 7176-22:2014	See ISO 7176-22 report 4939190.62	P
7.3	Human test occupant		P
	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 0kg to +5kg		P
	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 7176-22:2014.	See ISO 7176-22 report 4939190.62	P
8	Wheelchair performance		P
8.1	Driving characteristics		P
8.1.1	General		P
	The loaded wheelchair shall meet the driving performance requirements specified in Table 3 and Table 4 for the type class of the wheelchair as specified in Clause 5.		P
	The rated slope specified by the manufacturer shall be not less than that specified in Table 3 for the type class of the wheelchair.		P
8.1.2	Ability to climb rated slope		P
	The wheelchair shall be capable of climbing at a speed not less than 2 km/h		P

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Clause	Requirement	Remarks	Verdict
	- the applicable rated slope for the type class of wheelchair specified in Table 3, or		N/A
	- the rated slope specified by the manufacturer, if it is greater	6° specified by the manufacturer	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	See appended table 8.1.2	P
8.1.3	Ground unevenness		P
	The wheelchair shall be capable of driving when any of its wheels is raised to a height specified in Table 3 for ground unevenness	See appended table 8.1.3	P
8.1.4	Maximum downhill speed		P
	The wheelchair shall not exceed 125 % of its maximum speed on the horizontal, when driving down	See appended table 8.1.4	P
	- the applicable rated slope for the type class of wheelchair specified in Table 3, or		N/A
	- the rated slope specified by the manufacturer, if it is greater	6° specified by the manufacturer	P
8.1.5	Dynamic stability		P
	The dynamic response score of the wheelchair shall be 2 or 3 as specified in Table C.1 of ISO 7176-2:2017 when tested on	See appended table 8.1.5 See ISO 7176-2 report 4939190.52	P
	- the applicable rated slope for the type class of wheelchair specified in Table 3, or		N/A
	- the rated slope specified by the manufacturer, if it is greater.	6° specified by the manufacturer	P
8.1.6	Obstacle climbing and descending		P
	The wheelchair shall be capable of climbing and descending obstacles of the height specified in Table 3 for the type class of the wheelchair or the maximum obstacle height specified by the manufacturer, whichever is greater, without any part of the wheelchair other than wheels or a kerb climbing device contacting the obstacle or the test plane.	See appended table 8.1.6	P
8.1.7	Static stability		P
	The wheelchair shall meet or exceed the minimum requirements for static stability specified in Table 3 for the type class of the wheelchair.	See appended table 8.1.7	P
8.1.8	Maximum speed		P

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Clause	Requirement	Remarks	Verdict

	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 3 for the type class of the wheelchair.	See appended table 8.1.8	P
8.1.9	Distance range		P
	The theoretical continuous driving distance range for the wheelchair shall not be less than the requirement specified in Table 3 for the type class of the wheelchair	See appended table 8.1.9	P
8.2	Static, impact and fatigue strength		P
	The wheelchair shall conform to the requirements of ISO 7176-8:2014 with the exception that wheelchairs of Class A are not required to be tested as specified in ISO 7176-8:2014, 10.4, drop test.	See appended table 8.2 See ISO 7176-8 report 4939190.58	P
	Arm supports shall conform to the static loading requirements of ISO 7176-8:2014 in the least favourable intended operating position.		P
8.3	Wheelchairs for use as seats in motor vehicles		N/A
	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.	Not used as seats in motor vehicles	N/A
	— 4.1.2 is replaced by the following:		N/A
	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.		N/A
	—5.1, second paragraph, is replaced by the following:		N/A
	All webbing of wheelchair-anchored belt restraints shall have a burning rate not exceeding 100 mm/min when tested as specified in ISO 3795.		N/A
	— 5.2.1 a) is replaced by the following:		N/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.		N/A

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Clause	Requirement	Remarks	Verdict
	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.		N/A
	— 5.2.2 e) is replaced by the following:		N/A
	Primary occupant-load-carrying components of the wheelchair shall not show visible signs of failure, unless there is a backup system to provide support		N/A
	If the wheelchair does not have a head restraint, risks associated with head excursion and neck forces to which the occupant can be exposed during vehicle collisions shall be addressed in the risk management process (see 6.1).		N/A
8.4	Climatic performance		P
	The wheelchair shall conform to the requirements of ISO 7176-9:2009.	See appended table 8.4 See ISO 7176-9 report 4939190.59	P
9	Component properties		P
9.1	Foot supports, lower leg support assemblies and arm supports		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,		P
	b) be adjustable in increments not exceeding 25 mm in any direction,		P
	c) be accessible and operable by the occupant or an assistant or both in accordance with the manufacturer's intended use of the wheelchair,		P
	d) be within the reach space shown in Figure 1, and		P
	e) be operable without the use of tools.		P
	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:		N/A

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Clause	Requirement	Remarks	Verdict
	f) means to prevent the occupant's feet from sliding into the gap shall be provided, or		N/A
	g) when the foot supports are tested in accordance with 9.1.2.2, any gap between them shall be less than:		N/A
	— 25 mm if the wheelchair is intended for use by a child;		N/A
	— 35 mm if the wheelchair is not intended for use by a child.		N/A
9.2	Component mass		N/A
	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).	No such part	N/A
	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.		N/A
9.3	Pneumatic tyres		N/A
	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.	No such part	N/A
	The tyres or the rims shall be marked with the maximum pressure in kPa, bar or PSI.		N/A
9.4	Means for maintaining a sitting posture		P
	The wheelchair shall have provision for a means to be fitted that enables the occupant to maintain a sitting posture.		P
	If the risk management process (6.1) indicates a risk of the occupant tipping or sliding forwards when the wheelchair is decelerating, the means shall be provided with the wheelchair;		P
	otherwise the manufacturer of the wheelchair shall make available such means as an option.		N/A
9.5	Resistance to ignition		P
	The surfaces of components which support the occupant, or which stay in contact with the occupant or the occupant's clothing, shall be tested as specified in 9.5.2.		P
	Progressive smouldering ignition or flaming ignition as defined in the standard applied shall not occur.		P

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Clause	Requirement	Remarks	Verdict

	This requirement does not apply to components of the power and control system, which are covered by 9.5.3.		P
9.5.3	Power and control systems		P
	Either of the following options a) or b) shall apply		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.		N/A
	The manufacturer shall use the process specified in EN ISO 14971:2012 to manage that risk.		N/A
	b) The power and control system of the wheelchair shall meet the requirements of ISO 7176-14:2008, 9.7, resistance to ignition.	See ISO 7176-14 report 4939190.61	P
10	Propulsion and braking systems		P
10.1	Means for operating brakes		P
	a) Means for operating brakes shall:		P
	1) be accessible and operable by the occupant or an assistant or both in accordance with the manufacturer's intended use of the wheelchair;		P
	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 2, if the wheelchair is intended to be operated solely by an assistant;		N/A
	4) have operating forces for engaging and disengaging that do not exceed those stated in Table 3 when tested in accordance with 10.1.2;		N/A
	b) If one or more brake levers are fitted to a wheelchair in the form used on bicycles and mopeds:	No such brake	N/A
	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/A
	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;		N/A

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	3) the grip 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 3).		N/A
	c) Means for releasing parking brakes shall be protected against activation caused by accidental contact		P
10.2	Braking functions		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 4 when tested in accordance with 10.2.2.1	Not exceed the limit	P
	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
	The maximum stopping distances of Table 4 do not apply for a running brake operated after the wheelchair has been put into freewheel mode.		P
	c) The risk management process shall address risks due to loss of braking if a wheel loses contact with the ground (see 6.1).		P
	d) 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		P
	e) The wheelchair shall have a parking brake which operates independently of tyre wear and tyre inflation pressure.		P
	f) Parking brakes shall meet the parking brake effectiveness requirement in Table 3 when tested in accordance with 10.2.2.2.		P
	g) Parking brakes shall be operable when there is no power from the battery supplying the drive system.		P
	h) Parking brakes shall be operable when the wheelchair is in freewheel mode		P
	i) If they are subject to wear, parking brakes shall have provision for adjustment and/or replacement as specified by the manufacturer		N/A

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	j) If the wheelchair is fitted with arm supports that can be moved or removed to enable transfer of the occupant into or out of the wheelchair, 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 that can make contact with the occupant during transfer.		P
	k) 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
	l) After testing of the parking brake in accordance with 10.2.2.4, parking brakes shall meet the parking brake effectiveness requirement in Table 3 when tested again in accordance with 10.2.2.2.		P
10.3	Freewheel device		P
	The wheelchair shall be fitted with a freewheel device that shall:		P
	- 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,		N/A
	- be within the reach space shown in Figure 2, 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 3,		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

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Clause	Requirement	Remarks	Verdict

	These requirements apply in addition to those concerning non-powered mobility stated in ISO 7176-14:2008.		P
	A battery independent from the motor drive battery may be used to supply energy to enable freewheel mode.		N/A
	Freewheel devices shall be protected against activation caused by accidental contact.		P
11	Operations		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
	Examples include:		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
	— use of assistant controls;		P
	— use of control devices.		P
11.2	Controls intended for operation by the occupant		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:		P
	- on/off switch or key,		P
	- speed regulator,		P
	- speed pre-setting,		P
	- running brake,		P
	- parking brake,		P
	- audible warning device,		P
	- direction indicator,		P

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Clause	Requirement	Remarks	Verdict
	- direction switch,		P
	- control device,		P
	- manual steering controls,		P
	- lighting controls,		P
	- seating adjustments,		P
	- detachable components, including removable arm supports, lower leg support assemblies, etc., to facilitate safe transfers into and out of the wheelchair,		N/A
	- steering controls,		P
	- freewheel device.	Not intended to be operated by the occupant	N/A
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 2.		P
	Examples include:		P
	— brakes;		P
	— control devices;		P
	— push handles; and		P
	— electrical ancillary equipment.		P
11.4	Assistant control unit, push handles and handgrips		N/A
	Switches intended to be operated by an assistant while driving the wheelchair shall be attached to an assistant control unit.		N/A
	When an assistant control unit is fitted:		N/A
	- 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		N/A
	- there shall be a means to support the assistant's hand or hands used to operate the control device.		N/A
	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:		N/A
	- a plane at 85° to the horizontal, that touches the rearmost points of the push handles as shown in Figure 5;		N/A

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	- two planes not less than 350 mm apart equidistant from a vertical plane parallel to the forward direction of travel that bisects the wheelchair,		N/A
	unless the intended occupant is a child;		N/A
	- the horizontal test plane.		N/A
	When the wheelchair is fitted with push handles, the handgrips shall be at least 75 mm in length and between 20 mm and 50 mm in diameter.		N/A
	When push handles are fitted with controls that are intended to be used by being gripped by one hand, the grip width when no force is applied shall not be greater than 100 mm and should not be greater than 80 mm (see Figure 3).		N/A
11.5	Operating forces		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 3 when tested in accordance with 11.5.2.	See appended table 11.5	P
	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:		N/A
	- 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, and	No such knob	N/A
	- 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.		N/A
11.6	Occupied seating adjustments		P
	If the manufacturer specifies that the seating can be adjusted by an assistant or the occupant or both while the occupant is seated:		P
	— the assistant and/or the occupant shall not have to apply or withstand a force (e.g. the combined weight of the occupant and the seating) which presents a moving and handling safety hazard to the assistant and/or the occupant; and		P
	— movement of the seating, whether continuous or incremental, shall automatically be prevented.		P

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Clause	Requirement	Remarks	Verdict
	Controls for seating adjustments intended to be operated by the occupant shall be accessible to the occupant from all seating positions.		P
12	Electrical systems		P
12.1	General requirements		—
	The wheelchair shall conform to the requirements of ISO 7176-14:2008, except as specified in 9.5.3.		P
	The wheelchair and battery charger shall conform to the requirements of ISO 7176-21:2009.	See ISO 7176-21 report Not evaluated in this report	N/E
12.2	Circuit protection		P
	Operation of the circuit protection for each of the following functions shall not affect the operation of the remaining functions:		P
	a) electrically powered driving, braking and steering;		P
	b) electrically powered parts of the body support system;		P
	c) electrically powered lights, direction indicators and hazard warning flashers.		P
12.3	Battery chargers		—
	Battery chargers for wheelchairs shall conform to the requirements of ISO 7176-25:2013, with the following modification.	Lithium battery pack used. ISO 7176-31 applicable	N/A
	5.1.2.2 is replaced by the following:		P
	Battery chargers shall meet the requirements of EN 60335-2-29:2004 for class II appliances. The applicable electrical requirements of EN 60601-1:2006 for class II ME equipment may be applied as an alternative to the applicable electrical requirements of EN 60335-2-29:2004.	EN 60335-2-29 approved charger	P
	In addition, wheelchairs that include an on-board battery charger shall conform to the applicable electrical requirements of EN 60601-1:2006	Not an on-board battery charger	N/A
	Battery chargers shall conform to the requirements of ISO 7176-21:2009.	See ISO 7176-21 report Not evaluated in this report	N/E
12.3.3	Manual adjustment for battery type		N/A
	Where a battery charger is intended for use with more than one type of battery, and a manual operation is necessary to select the battery type:		N/A
	— the selected battery type shall be conspicuously visible from the exterior of the battery charger;	Only 1 type battery pack specified by manufacturer	N/A

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	— it shall not be possible to select the battery type without a tool, key entry combination or similar means for restricting access; and		N/A
	— the method for selecting the battery type shall not consist of operations which are performed in normal use of the charger.		N/A
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
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
	Each emergency stop device shall:		P
	- be clearly identifiable, clearly visible and quickly accessible by the intended operator, and		P
	- 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.		P
	It shall not be possible to engage the device without triggering a stop command.		P
	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

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	Additional emergency stop devices may be attached to a wheelchair to be operated by an assistant.		N/A
	Where the intended occupant has an impairment which restricts their ability to operate an emergency stop device, the risk management process (6.1) should take this into account.		N/A
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 can be subject to national requirements for lighting and reflectors.		N/A
	If there are no national requirements, the wheelchair is expected to conform to relevant lighting requirements in automotive Regulations of the European Union (e.g. Regulation 661/2009 [18]).		P
12.8	Switching off while driving		P
	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 4.		P
12.9	Software		N/E
	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.	Software was not evaluated in this report	N/E
12.10	Lithium cells and batteries		P
	Sealed secondary lithium cells and batteries containing non-acid electrolyte shall conform to the requirements of EN 62133-2:2017.		P
12.11	Remote control		N/A
	Where remote control is used for any moving part of the wheelchair or any lighting function, the following aspects shall be included in the risk management process:		N/A
	— loss of signal;	No Remote control	N/A
	— signal errors;		N/A
	— reliability level;		N/A
	— correct pairing between the remote control and the wheelchair;		N/A

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	— correct identification of the paired remote control and wheelchair to the operator;		N/A
	— interference from multiple remote controls;		N/A
	— security and malicious interference;		N/A
	— reliability of software in the remote control;		N/A
	— gradual loss of power in the remote control;		N/A
	— range.		N/A
	This requirement applies regardless of whether the remote control acts between components of the wheelchair or between an external device and the wheelchair.		N/A
13	Information supplied by the manufacturer		P
13.1	General		P
	Each wheelchair shall be provided with documentation and labelling that conform to the applicable requirements in EN ISO 20417:2021 in addition to the requirements specified in this document.		P
	The manufacturer shall provide the documentation in three separate sections: pre-sale, user and servicing information, as specified in 13.2, 13.3 and 13.4 respectively.		P
	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
13.2	Pre-sale information		P
	Pre-sale information shall include the following:		P
	a) information on how to obtain the user information in a format appropriate for use by visually impaired people;	Not suitable to drive by visually impaired people	N/A
	b) a description of the intended occupant of the wheelchair, including the occupant's mass;		P
	c) the intended operator (occupant, assistant or both), intended use and the intended environment;		P
	d) the type class of the wheelchair: Class A, Class B or Class C;	Class B	P
	e) 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 and/or dismantled for storage or transportation;		P

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	f) the minimum width of corridor in which the wheelchair can be turned to face the opposite direction;		P
	g) the rated slope, expressed in degrees;		P
	h) the standard options that are available for the wheelchair;		P
	i) if the wheelchair can be dismantled or has any removable parts, the mass of the heaviest part;		P
	j) a statement that the wheelchair is intended to be used as a seat in a motor vehicle, or a warning that the wheelchair is not intended to be used as a seat in a motor vehicle;		P
	k) 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
	l) the maximum height of kerb which the wheelchair can descend safely;		P
	m) 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.	Not intend to be programmed by user	N/A
13.3	User information		P
	User information shall be provided by the manufacturer with each wheelchair.		P
	Further copies shall also be available for any subsequent user of the wheelchair.		P
	User information shall contain all pre-sale information and the following where applicable:		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) Information on any adjustments that can be made, and the competency required to carry out these adjustments;		P

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Clause	Requirement	Remarks	Verdict
	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;	Not pneumatic tyre	N/A
	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
	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) 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;	No such intended use	N/A
	p) if the manufacturer specifies that the wheelchair is not intended for use in the motor vehicle, a warning to that effect		P
	q) instructions on how to use the means for maintaining a sitting posture (see 9.4) and the circumstances in which it should be used;		N/A
	r) instructions on how to obtain and fit the means for maintaining a sitting posture (see 9.4) if it is not supplied with the wheelchair;		P
	s) the positions of points intended to carry additional loads;		P

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Clause	Requirement	Remarks	Verdict
	t) instructions for preparing the wheelchair for long-term storage (e.g. longer than four months) and for preparing it for use afterward;		P
	u) warning that the wheelchair can disturb the operation of devices in its environment that emit electromagnetic fields (e.g. alarm systems of shops, automatic doors, etc.);		P
	v) a warning that the driving performance of the wheelchair can be influenced by electromagnetic fields (e.g. those emitted by electricity generators or high-power sources);		P
	w) a warning that the stopping distance on slopes can be significantly greater than on level ground;		P
	x) information on the recycling of used batteries and of the wheelchair;		P
	y) if the characteristics of the wheelchair (including the occupant as applicable) exceed the limits specified in Appendix M of Commission Regulation (EU) No 1300/2014 [19], a statement to that effect (see Annex D for additional information);		N/A
	z) information on how to find out about product safety notices and product recalls, for example by ensuring the supplier has up-to-date contact details;		P
	aa) the expected service life of the wheelchair;		P
	bb) information on how to get repairs and servicing;		P
	cc) warranty information.		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	Labeling		P
	The manufacturer shall apply permanent labelling for the following:		P
	a) the maximum load of the wheelchair, i.e. the total of the maximum occupant mass and the maximum mass of any other items intended to be carried by the wheelchair;		P
	b) 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

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	c) 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);		N/A
	d) for wheelchairs not intended to be used as a seat in a motor vehicle, a warning to that effect;		P
	e) for Class A wheelchairs not intended for use outdoors, a warning to that effect.		N/A

TABLE 8.1.2: Ability to climb rated slope				P
Type classes	Gradient of the adjustable test plane	Speed after travelling 5 m up the slope	Remarks	
B	> 15°	6km/h		
Supplementary Information:				
¹ The wheelchair shall achieve or exceed a speed of 2 km/h (0,56m/s) after travelling 5 m up the slope. ² The self-balance function was enabled during test.				

TABLE 8.1.3: Ground unevenness			P
Type classes	The height of test block specified in Table 1	Remarks	
B	80mm		
Supplementary Information:			

TABLE 8.1.4: Maximum downhill speed				P
Type classes	Gradient of the adjustable test plane	125% x Maximum speed on the horizontal (m/s)	Downhill speed (m/s)	Remarks
B	10°	125% x 1,5 = 1,9	1,5	
Supplementary Information:				
¹ The applicable rate slope for the type class of wheelchair specified below, or the rated slope specified by the manufacturer, whichever is greater. ² The self-balance function was enabled during test.				

TABLE 8.1.5: Dynamic stability								P
Test	Antitip devices	Method of retardation	Stability score Ramp angle (°)					Remarks
			0	3	6	10	8 ¹	
Rearward Dynamic Stability								
8.2 Starting forwards	With antitip devices	—	3	3	3	3	N/A	
	Without antitip devices	—	N/A	N/A	N/A	N/A	N/A	
8.3 Stopping after travelling forwards	With antitip devices	Release	3	3	3	3	N/A	
		Power off	3	3	3	3	N/A	
		Applying reverse	3	3	3	3	N/A	
	Without antitip devices	Release	N/A	N/A	N/A	N/A	N/A	
		Power off	N/A	N/A	N/A	N/A	N/A	
		Applying reverse	N/A	N/A	N/A	N/A	N/A	
8.4 Braking when travelling backwards	With antitip devices	Release	3	3	3	3	N/A	
		Power off	3	3	3	3	N/A	
		Applying reverse	3	3	3	3	N/A	
	Without antitip devices	Release	N/A	N/A	N/A	N/A	N/A	
		Power off	N/A	N/A	N/A	N/A	N/A	
		Applying reverse	N/A	N/A	N/A	N/A	N/A	
Forward Dynamic Stability								

9.2 Braking when travelling forwards	—	Release	3	3	3	3	N/A	
		Power off	3	3	3	3	N/A	
		Applying reverse	3	3	3	3	N/A	
Dynamic Stability in Lateral Directions								
10.3 Turning from a stationary start	—	Release	3	3	3	3	N/A	
10.4 Turning in a circle at maximum speed (minimum diameter, in metres)	—	Power off	3	N/A	N/A	N/A	N/A	
10.5 Turning suddenly at maximum speed	—	Applying reverse	3	N/A	N/A	N/A	N/A	
Supplementary Information:								
¹ is the rated slope specified by the manufacturer.								
² The dynamic response scores of the wheelchair shall be 2 or 3.								
³ Scores 3: No tip; At least one lifting wheel remains on the test plane. Score 2: Transient tip; All lifting wheels lose contact, then drop back onto the test plane, whether or not any antitip devices contact the test plane. Score 1: Stuck on antitip device; All lifting wheels lift off, the wheelchair antitip device(s) contacts the test plane, and the wheelchair remains stuck on the antitip device(s). Score 0: Full tip; The wheelchair tips completely over (90° or more from its original orientation) unless caught by a restraining device or testing personnel for test purposes.								
⁴ The self-balance function was enabled during test.								

TABLE 8.1.6: Obstacle climbing and descending				P
The test run-up distance			500mm	
The minimum obstacle height specified in Table 3			15mm	
Direction	Condition	The part of the wheelchair came into contact with the obstacle	Remark	
Obstacle climbing	Normal run	80mm		
	With a run-up	80mm		
	With the wheelchair facing rearwards	80mm		
	With a run-up as well as the wheelchair facing rearwards	80mm		
Obstacle descending	Normal run	80mm		
	With the wheelchair facing rearwards	80mm		
Supplementary Information: See ISO 7176-10 report 4939190.60				

TABLE 8.1.7: Static stability				P
Stability direction		Tipping angle		Remark
		Least stable ¹	Most stable ²	
Forward	Front wheels locked	N/A	N/A	
	Front wheels unlocked	> 15°	> 15°	
rear	Rear wheels locked	> 15°	> 15°	
	Rear wheels unlocked	> 15°	> 15°	
	Antitip devices	N/A	1.1°	

sideways	Left	14	> 15°	
	Right	14	> 15°	
Supplementary Information: See ISO 7176-1 report 4939190.51				
¹ The self-balance function was disabled during test.				
² The Anti-tip devices are not adjustable; The self-balance function was enabled during test.				

TABLE 8.1.8: Maximum speed			P
Maximum forward speed (m/s)	Maximum reverse speed (m/s)	Maximum speed specified in Table 3 (m/s)	Remarks
1,52	0,58	Forwards horizontal: 5,56m/s Reverse horizontal: 1,39m/s	
Supplementary Information: See ISO 7176-6 report 4939190.56			

TABLE 8.1.9: Distance range						P
Continuous driving test						
E_c (W·h)	D_c (m)	e_c (W·h/km)	E_{BAT} (W·h)	R_c (km)	The requirement specified in Table 3 (km)	Remarks
590,94	25805	22,9	591,05	25,81	25	
Supplementary Information: See ISO 7176-4 report 4939190.54						

TABLE 8.2: Static, impact and fatigue strength				P
Clause	Test	Result	Components needed to be tightened, adjusted or replaced	
Static strength				
8.4	Armrests: resistance to downward forces	Meet the requirements of the functional check		
8.5	Footrests: resistance to downward forces	Meet the requirements of the functional check		
8.6	Tipping levers	Meet the requirements of the functional check		
8.7	Handgrips	N/A	No such components	
8.8	Armrests: resistance to upward forces	Meet the requirements of the functional check		
8.9	Footrests: resistance to upward forces	Meet the requirements of the functional check		
8.10	Push handles: resistance to upward load	N/A	No such components	
Impact strength				
9.3	Backrest: resistance to impact	Meet the requirements of the functional check		
9.4	Handrim: resistance to impact	N/A	No such	

			components
9.5	Castors: resistance to impact	Meet the requirements of the functional check	
9.6	Footrests: resistance to impact	Meet the requirements of the functional check	
9.7	Front structure: resistance to impact	Meet the requirements of the functional check	
Fatigue tests			
10.4	Two-drum test	Meet the requirements of the functional check	
10.5	Drop test	Meet the requirements of the functional check	
Supplementary Information: See ISO 7176-8 report 4939190.58			

TABLE 8.3: Wheelchairs for use as seats in motor vehicles			N/A
Clause	Test	Result	Remarks
5.1	Wheelchair-anchored belt restraints		
5.2	Frontal impact		
5.3	Accessibility of securement points intended for use with four-point strap-type tiedowns with hook-type end-fittings		
5.4	Accommodation of vehicle-anchored belt restraints		
Supplementary Information:			

TABLE 8.4: Climatic performance			P
Test Name	Test Condition	Remarks	
Testing of cold operating conditions and resistance to condensation	$(-25 \pm 2)^\circ\text{C}$	Meet the requirements of the functional check after test No driven part exhibited unintended movement	
Testing of hot operating conditions	$(50 \pm 2)^\circ\text{C}$	Meet the requirements of the functional check after test No driven part exhibited unintended movement	
Testing of cold storage conditions	$(40 \pm 5)^\circ\text{C}$	Meet the requirements of the functional check after test No driven part exhibited unintended movement	
Testing of hot storage conditions	$(65 \pm 5)^\circ\text{C}$	Meet the requirements of the functional check after test No driven part exhibited unintended movement	
Testing of protection against ingress of liquids	IPX4	Meet the requirements of the functional check after test No driven part exhibited unintended movement	
Supplementary Information: See ISO 7176-9 report 4939190.59			

TABLE 9.5: Resistance to ignition			P
Part under test	Result		Remarks
Upholstered composite parts	Progressive smouldering ignition and flaming ignition as defined in the Standard applied did not occur		
Foam materials	Progressive smouldering ignition and flaming ignition as defined in the Standard applied did not occur		
Other parts in contact with the occupant	Progressive smouldering ignition and flaming ignition as defined in the Standard applied did not occur		
Power and control systems	All plastic parts of controller are V-0 material		
Supplementary Information: See ISO 16840-10 report 4939190.64			

TABLE 10.1: Means for operating brakes			P
Brake levers	The maximum operating force	Operating forces stated in Table 3	Remark
Joystick	5N	13,5 ± 2N	Hand
Supplementary Information: See ISO 7176-3 report 4939190.53			

TABLE 11.5: Operating forces			P
Controls	The calculated operating force	Allowable operating forces	Remarks
Joystick	5N	13,5 ± 2N	Hand
Buttons	5 ± 1N	5N	Finger
Supplementary Information: See ISO 7176-3 report 4939190.53			

TABLE ISO 7176-14			P
7.2.3.2: Open-circuit test			
Conductor	The distance taken to stop normal condition	The distance taken to stop open-circuit condition	Remarks
C35	710mm	720mm	
C38	700mm	710mm	
C47	690mm	720mm	
Q6	690mm	700mm	
Q36	700mm	690mm	
7.2.3.3: Short-circuit test			
Conductor	The distance taken to stop normal condition	The distance taken to stop short-circuit condition	Remarks
C35	720mm	710mm	
C38	690mm	710mm	
C47	720mm	700mm	
Q6	700mm	690mm	
Q36	710mm	710mm	
7.2.3.4: Leakage current test			
Conductors	any drive wheel turns with a circumferential speed greater than 0,1 m/s	any part of the wheelchair that usually comes into contact with the occupant moves more than 10 mm	Remarks

C35	Wheel does not turn	No movement	
C38	Wheel does not turn	No movement	
C47	Wheel does not turn	No movement	
Q6	Wheel does not turn	No movement	
Q36	Wheel does not turn	No movement	
7.3.3.2: Open-circuit test			
Conductor	The distance taken to stop normal condition	The distance taken to stop open-circuit condition	Remarks
Q12	710mm	720mm	
Q3	710mm	700mm	
C4	710mm	700mm	
7.3.3.3: Short-circuit test			
Conductor	The distance taken to stop normal condition	The distance taken to stop short-circuit condition	Remarks
Q12	720mm	700mm	
Q3	710mm	700mm	
C4	620mm	710mm	
7.4.3: Ability to stop when power is removed			
$2 \times L_i$	The arithmetic mean stopping distance i)	The arithmetic mean stopping distance m)	Remarks
6080mm	600mm	600mm	
8.2 Current consumption while switched off			
The mean current		The maximum limit, I_{2900}	Remarks
0mA		8mA	
8.6 Controller over-voltage protection			
Voltage	Movement of any part of the wheelchair	Hazardous situation if the wheels were in contact with the ground	Remarks
31,92Vdc	No movement	No hazard	
8.7 Switch-off while driving			
Mean to switch off the wheelchair	Direction	Hazardous situation	Remarks
Press the switch button to cut off the power supply	Forward	The wheelchair stopped immediately. No hazardous.	
	Reverse	The wheelchair stopped immediately. No hazardous.	
Unplug the power cord of the controller	Forward	The wheelchair stopped immediately. No hazardous.	
	Reverse	The wheelchair stopped immediately. No hazardous.	
8.9 Drive inhibit during charging			
Situation		Movement of the wheelchair	Remarks
Switch on the wheelchair controller		No movement	
Switch off the supply mains		No movement	
8.10 Charging connection voltage drop			
U_{ep}	$U_{batt,tot}$	dU	Limitation
N/A			
8.11 Non-powered mobility			

Situation	Force required	The maximum allowable force	Remarks
Means to disengage the drive and braking system that can be operated without the use of a tool	28N	60N	
Start the loaded wheelchair moving in a straight line on the horizontal without electrical power	52N	150N	

8.12 Brakes

Brake	Single fault of components	Direction	Distance of movement down the slope	Remarks
Operated	U22	Face up the slope	0	Controller displayed fault
Operated	U22	Face down the slope	0	Controller displayed fault
Operated	U23	Face up the slope	0	Controller displayed fault
Operated	U23	Face down the slope	0	Controller displayed fault

9.1: Electrical isolation

Test	The maximum current (mA)	Limitation current	Remarks
Positive connection test	0,03	5mA	
Negative connection test	0,07	5mA	

9.5: Surface temperatures

Ambit temperature		25°C		
Thermocouple No.	Thermocouple location or the copper winding tested by change-of-resistance	Temperature rise (K)	Max measured temperature (°C)	Remarks
102	Controller joystick	0,71	25,36	
103	Handrest	0,82	25,48	
104	Seat back	0,79	25,46	
105	Seat	1,04	25,56	
106	Headrest	1,03	25,61	

10.2: Operating forces

Test parts	The maximum force (N)	Limitation force (N)	Remarks
Joystick on controller	5,0	13,5	Hand
Push-button	5,0	5	Finger
Toggle switches	N/A		
Positive differential air pressure switches (puff)	N/A		
Negative differential air pressure switches (sip)	N/A		

10.6.3: Electrical isolation

Direction	The maximum time-weighted sound level (dBA)	The allowable sound pressure level (dBA)	Remarks
Forward	58dB(A)	75dB(A)	
Reverse	40dB(A)	75dB(A)	
10.6.4: Ancillary equipment test			
Position	The maximum time-weighted sound level	The allowable sound pressure level	Remarks
1	32dB(A)	75dB(A)	
2	30dB(A)	75dB(A)	
3	31dB(A)	75dB(A)	
4	32dB(A)	75dB(A)	
10.7: Acoustic warning device			
Position	The maximum time-weighted sound level (dBA)	The allowable sound pressure level (dBA)	Remarks
1	78dB(A)	75dB(A)	
2	76dB(A)	75dB(A)	
3	85dB(A)	75dB(A)	
4	80dB(A)	75dB(A)	

Attachment 1: Photo documentation

Details of: General view of Charger



Details of: General view



Details of: General view



Details of: General view



Details of: Rising condition



Details of: Battery pack and rear wheel lock



Details of: Rocker and Control panel



Details of: Battery pack



Details of: Wheelchair under test, Rearward orientation



Details of: Wheelchair under test, Rearward orientation



Details of: Wheelchair under test, Lateral orientation

View:

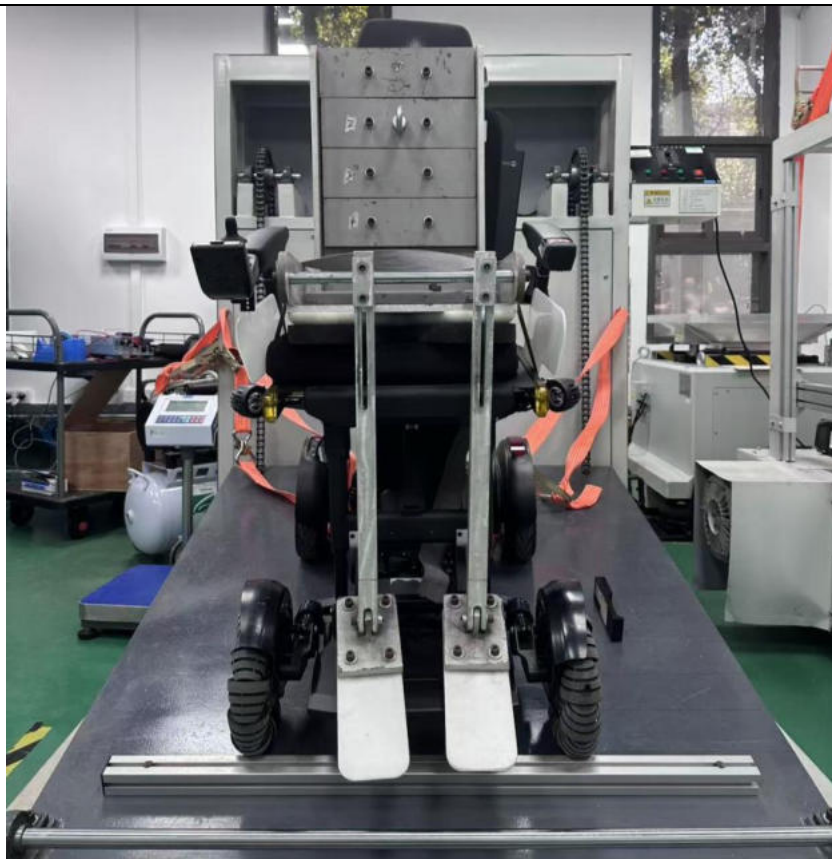
- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test, Forward orientation

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test

View:

general

front

rear

right

left

top

bottom



Details of: Wheelchair under test

View:

general

front

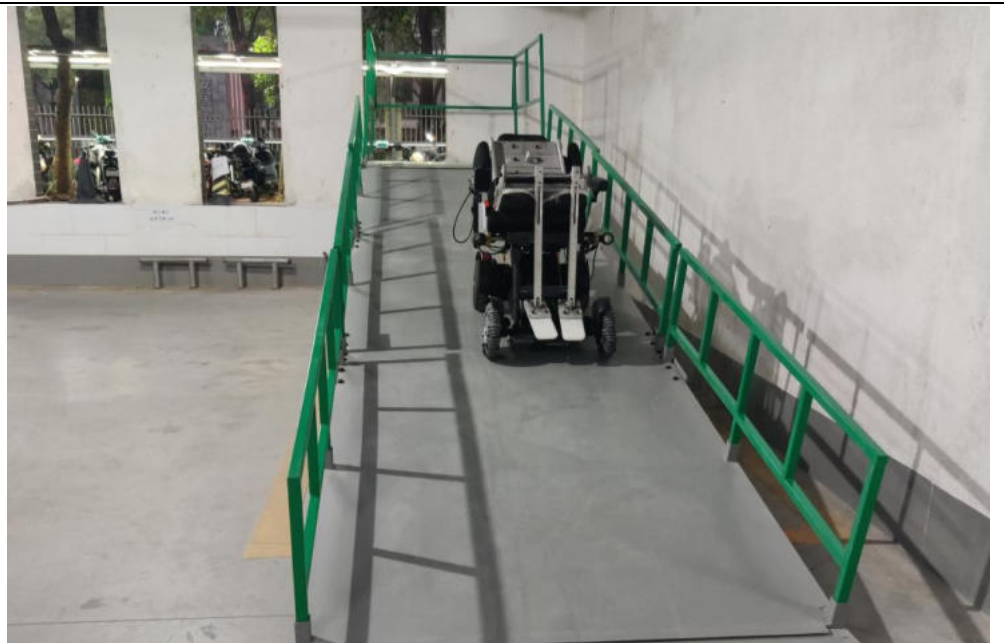
rear

right

left

top

bottom



Details of: Wheelchair under test

View:

general

front

rear

right

left

top

bottom



Details of: Wheelchair under test

View:

general

front

rear

right

left

top

bottom



Details of: Wheelchair under test

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Armrests: resistance to downward forces >

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Footrests: resistance to downward forces >

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Tipping lever >

View:

general

front

rear

right

left

top

bottom



Details of: Wheelchair under test < Armrests: resistance to upward forces >

View:

general

front

rear

right

left

top

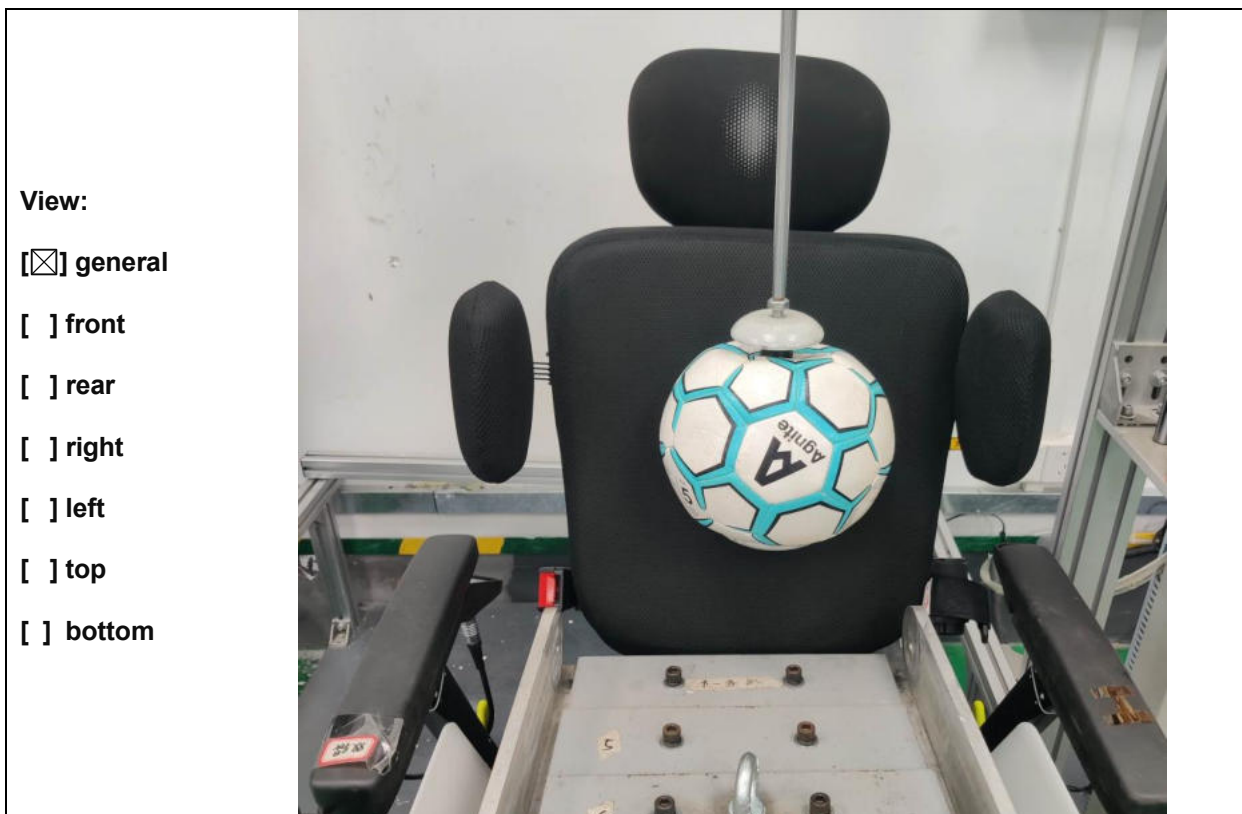
bottom



Details of: Wheelchair under test < >



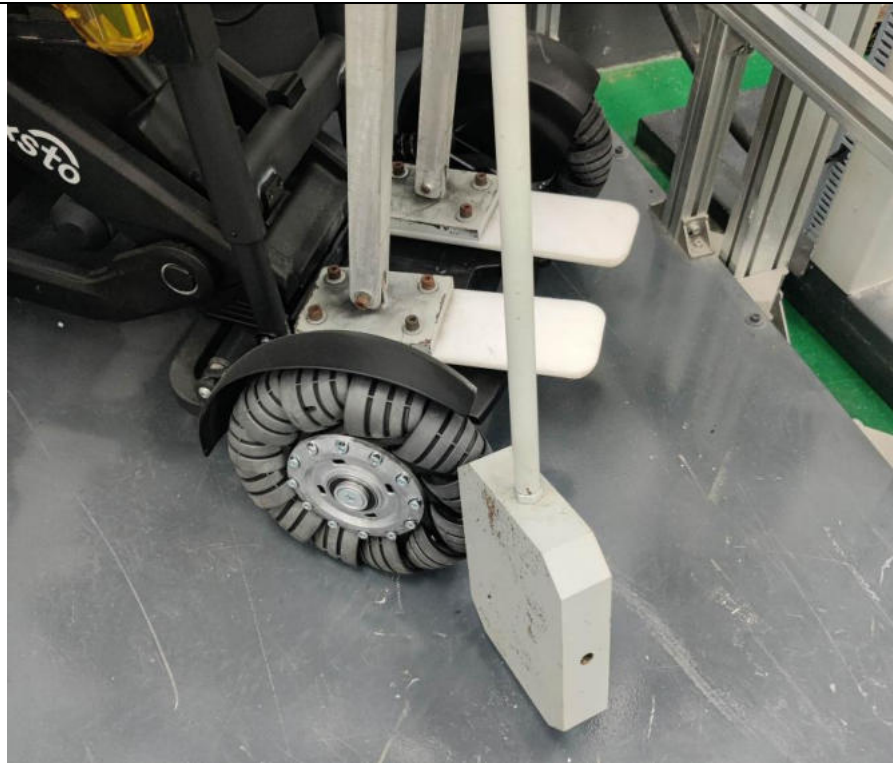
Details of: Wheelchair under test < Backrest: resistance to impact >



Details of: Wheelchair under test < Castors: resistance to impact >

View:

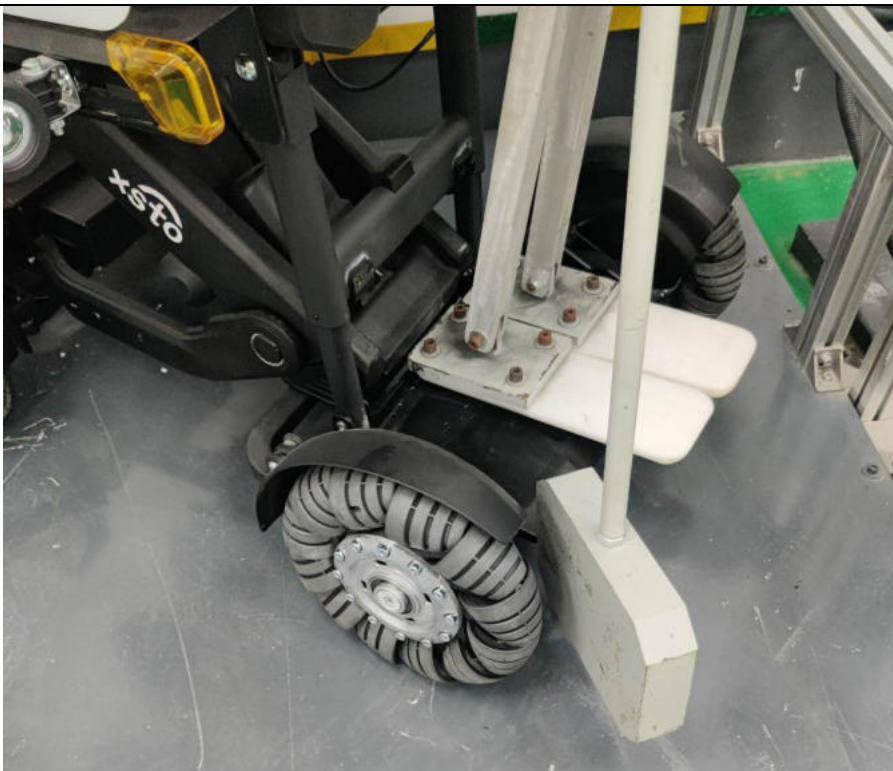
- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Footrests: resistance to impact >

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Impacts on anti-tip devices >

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Multi-drum test >

View:

- general
- front
- rear
- right
- left
- top
- bottom



Details of: Wheelchair under test < Drop test >

View:

general

front

rear

right

left

top

bottom



Details of: Seat after test



Details of: Backrest after test



-- End of this report --