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Technical Report No. 71385443

Revision: 1
dated 2011-03-30

Client:	Invacare Deutschland GmbH Kleiststrasse 49 32457 Porta Westfalica	
Manufacturing place:	Invacare Deutschland GmbH Kleiststrasse 49 32457 Porta Westfalica	
Test object:	Type / model:	Kite
	Classification acc. to. DIN EN ISO 9999: 2007	12 23 06
	Class of use:	B
	Max. user weight:	160 kg
Test specifications:	DIN EN 12184: 2009	
Purpose of examination:	1. re-testing due to the points of non-compliance as listed in the Technical Report No. 71383283 according to the test specifications.	
Test result:	The test results show that the presented product is in compliance with the specified requirements.	

Project Manager:
Dipl.-Ing. Michael Kese
Date: 2011-03-30

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TÜV SÜD Product Service GmbH

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Germany

1 Description of the test subject

The electrically driven wheelchair type "Kite" presented for testing is designed to operate in indoor and outdoor environment. The seat inclination is electrically adjustable. The electrically driven wheelchair can be controlled via the joystick module of the DX2 controller.

1.1 Technical Data

Test subject:	electrically driven wheelchair
Model:	Kite
Class of use:	B
Total height:	1020 mm
Total length:	1110 mm
Total width:	665 mm
Obstacle height:	100 mm (with obstacle climbing device)
Max. speed:	10 km/h
Max. load:	160 kg
Max. safe slope:	10° (in the configuration as from manufacturer specified)
Driving motor:	Invacare, type: 4PH-18 (340 W; 24 V_{DC})
Drive of the adjustment of the seat angle:	REAC, type: RE25 (3200 N; IP55; 7A; 24 V_{DC})
Power electronics:	Dynamic Controls Ltd, type: DX2 DX2-PMA90L; DX2-ACT4; DX2-REM550
Batteries:	2x MK battery, type: M24SLDGFT (12 V_{DC}; 73 Ah)
Battery charger:	Shanghai Winsunny Electronics tech., type: WS230-1 (IN: 230 V_{AC}; 50/60 Hz; OUT: 24 V_{DC}; 8A)

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2 Order

2.1 Date of Purchase Order

The testing of the Kite has been carried out per purchase order of Invacare Deutschland GmbH dated at 2011-02-11.

2.2 Date of Receipt of Test Subject

The testing has been performed at TÜV SÜD Product Service, Masurenweg 1-3, D-30163 Hanover. The test subject was delivered to the test laboratory on 2011-02-16 (HAN-112054).

2.3 Results

The points of non-compliance as listed in the Technical Report No. 71383283 were removed at the test subject and documents presented for re-testing.

3 Remarks

3.1 General remarks

Motorised wheelchairs are motor vehicles according to the traffic law (§1, chapter 2). Wheelchairs which shall be operated on public roads have to fulfil the requirements of the German Traffic Law (StVZO), of the Road Traffic Regulations (StVO) as well as of the FZV (Fahrzeugzulassungsverordung). This also applies to motorized wheelchairs with a design-related maximum speed of 6 km/h (see also §18 StVZO, explanation 1).

3.2 Remarks to user manual

The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

4 Summary

The test results show that the presented product is in compliance with the specified requirements.

TÜV SÜD Product Service GmbH
Technical report checked:

i.A. Torsten Zimmer, Dipl.-Ing.
Department Rehabilitation

TÜV SÜD Product Service GmbH
Project Manager

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Product Service

TEST REPORT

PPP 31009:2009

TÜV SÜD Test program for

Electrically powered wheelchairs, scooters and their chargers

Report reference No. ..... :	71385630
Date of issue ..... :	2011-03-31
Project manager ..... :	Dipl.-Ing. Michael Kese
Testing laboratory ..... :	TÜV SÜD Product Service GmbH
Address ..... :	Masurenweg 1-3, D-30163 Hanover
Testing location ..... :	as above
Applicant ..... :	Invacare Deutschland GmbH
Client number ..... :	12941
Address ..... :	Kleiststrasse 49, 32457 Porta Westfalica
Contact person ..... :	Dirk Hoffmann
Standard ..... :	This TÜV SÜD test program is based on the following standards: EN 12184: 2009
Test Report Form No. ..... :	Test Report TUV_PPP_31009 Rev. 05 / 2009-08
TRF originated by. ..... :	TÜV SÜD Product Service GmbH, Dipl.-Ing. Michael Kese
Master TRF ..... :	PPP XYZ_A.doc
Copyright blank test report ..... :	This test report is based on the content of the internal test program. The test program considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service GmbH. TUV SUD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Test procedure ..... :	☐ GS ☐ TÜV Mark, ☐ EU-Directive, ☒ without certification
Non-standard test method ..... :	---
National deviations ..... :	---
Number of pages (Report) ..... :	41
Number of pages (Attachments) ..... :	---
Compiled by ..... : Michael Kese	Approved by .... : Torsten Zimmer
(+ signature) Michael Kese	(+ signature)

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Test sample.....:	(HAN-112054)
Type of test object .....:	electrically driven wheelchairs
Trademark.....:	
Model and/or type reference .....:	Kite
Rating(s) .....:	See "Copy of marking plate"
Manufacturer.....:	Invacare Deutschland GmbH
Client number.....:	12941
Address.....:	Kleiststrasse 49, 32457 Porta Westfalica
Sub-contractors/ tests (clause) .....:	--
Address.....:	--
Order description.....:	Testing of the mechanical safety of the electrically driven wheelchair "Kite" acc. to EN 12184: 2009
Date of order.....:	2011-02-11
Date of receipt of test item .....:	2011-02-16
Date(s) of performance of test .....:	2011-02-18 to 2011-03-29

Test item particulars: --

Possible test case verdicts:

- test case does not apply to the test object .....:	N(.A.)
- test object does meet the requirement .....:	P(ass)
- test object does not meet the requirement.....:	F(ail)

Possible suffixes to the verdicts:

- suffix for detailed information for the	- C(omment)
- suffix for important information for factory inspection...:	- M(anufacturing)

Attachments: --

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a comma is used as the decimal separator.
The test 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.

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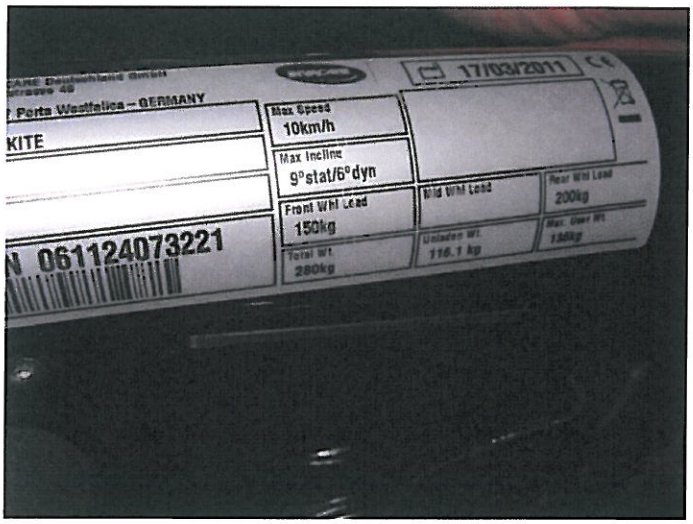
Summary of testing:

☒ The test subject was found to be in compliance with the test specification(s).
Das vorgestellte Produkt erfüllt die Anforderungen der genannten Prüfspezifikation(en).

☐ After removal of the points of non-compliance as listed in the report and appropriate re-testing the test subject is in compliance with the test specification(s).
Re-testing has to be performed within the following six months, otherwise a complete re-test may become necessary.
Nach Beseitigung der im Bericht aufgeführten Abweichungen und erfolgreicher Nachprüfung erfüllt das Produkt die Anforderungen der genannten Prüfspezifikation(en). Eine Nachprüfung muss innerhalb von 6 Monaten erfolgen, da sonst eine Neuprüfung erforderlich werden kann.

Copy of marking plate:



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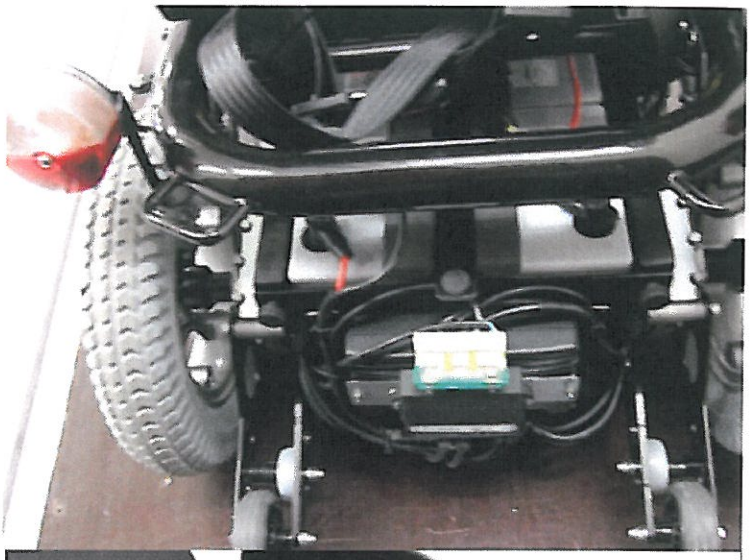
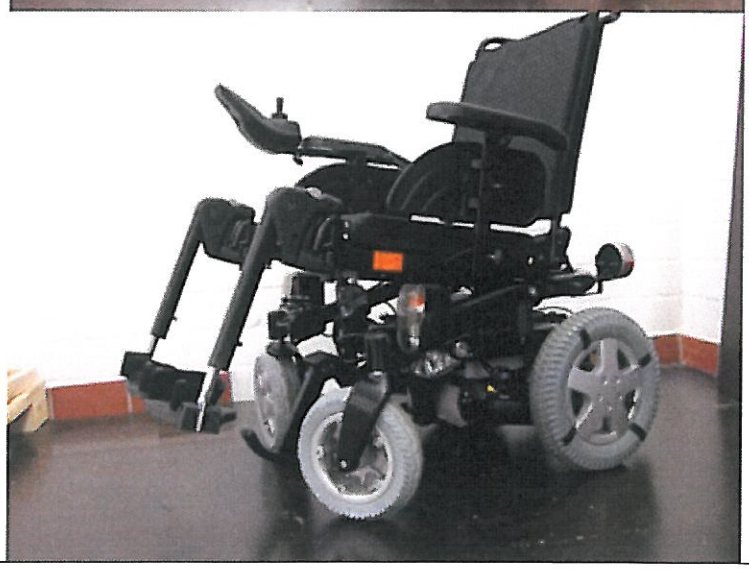
Picture of the product





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Characteristic data
(not shown on the marking plate)

total length incl. footrests *(Gesamtlänge einschl. Fußstützen)*:	1110 mm
total length without footrests *(Gesamtlänge ohne Fußstützen)*:	940 mm
width *(Breite)*:	635 mm – 665 mm
height *(Höhe)*:	1020 mm
seat width *(Sitzbreite)*:	410 mm
seat depth *(Sitztiefe)*:	440 mm
seat height *(Sitzhöhe)*:	495 mm
backrest height *(Rückenlehnenhöhe)*:	500 mm
max. user weight *(max. Nutzergewicht)*:	160 kg
max. safe slope *(max. sichere Neigung)*:	10° (in the configuration as from manufacturer specified)
max. speed *(max. Geschwindigkeit)*:	10 km/h
max obstacle height *(max. Hindernisüberwindung)*:	100 mm
wheelbase *(Radstand)*:	470 mm
ground clearance *(Bodenfreiheit)*:	73 mm
braking system *(Bremssystem)*:	running brake: a brake operated by the power produced by a generator parking brake: spring loaded disc brake
driving wheels *(Antriebsräder)*:	
- size *(Grösse)*:	300-8
- tyres *(Bereifung)*:	air-filled *(luftbereift)* ☒ / rubber *(Vollgummi)* ☐
steering wheels *(Lenkräder)*:	
- size *(Grösse)*:	75/70-6
- tyres (Bereifung):	air-filled *(luftbereift)* ☒ / rubber *(Vollgummi)* ☐
power electronics *(Leistungselektronik)*:	Dynamic Controls Ltd, type: DX2 DX2-PMA90L; DX2-ACT4; DX2-REM550
driving motor *(Antriebsmotor)*:	Invacare, type: 4PH-18 (340 W; 24 V_{DC})
motor for adjustable seat height *(Motor für Sitzhöhenverstellung)*:	--
motor for adjustable seattilt *(Motor für Sitzwinkelverstellung)*:	REAC, type: RE25 (3200 N; IP55; 7A; 24 V_{DC})
motor for adjustable backrest *(Motor für Rückenlehnenverstellung)*:	--
batteries *(Batterien)*:	2x MK battery, type: M24SLDGFT (12 V_{DC}; 73 Ah)
battery charger *(Batterieladegerät)*:	Shanghai Winsunny Electronics tech., type: WS230-1 (IN: 230 V_{AC}; 50/60 Hz; OUT: 24 V_{DC}; 8A)

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Purpose of the product
(Description of intended use)

The electrically driven wheelchair type "KITE" is designed to operate in indoor and outdoor environment. The seat inclination is electrically adjustable. The electrically driven wheelchair can be controlled via the joystick module of the DX2 controller.
Kite is designed for active users who love outdoor acitivities yet who still require a compact vchair in their everyday life.

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Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
5	**Type classes**		
	Class A: compact, manoeuvrable wheelchairs, which are not always capable to overcome obstacles outdoor.		N
	Class B: wheelchairs, which are sufficiently compact and manoeuvrable for indoor and which can overcome some obstacles outdoor.		P
	Class C: wheelchairs, normally with larger dimensions, which are not intended to be used indoor. They can be driven at longer distances and can overcome obstacles outdoor.		N
6	**General requirements**		
	The wheelchair shall conform to the requirements as specified in EN 12182 for the following:		
	Intended performance and technical documentation		
	a) An aid shall have sufficient strength and durability to sustain all loads expected during intended use. This shall be confirmed by using, as appropriate, references to relevant clinical and scientific literature, strength and/or durability calculations, appropriate standards and test results.		P
	b) The intended performance including, if appropriate, strength, durability and tipping stability of an aid 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, if appropriate, references to relevant clinical and scientific literature, any strength and/or life calculations, appropriate standards and test results.		P
	Aids, that can be dismantled		
	If it is intended that an aid can be dismantled for storage or transportation, it shall not be possible to reassemble the aid in a manner that presents a hazard.		P
	Single use fasteners		
	If it is intended that an aid can be dismantled for storage or transportation, the fasteners which are loosened or removed to allow this dismantling shall not be single use fasteners.		P
	Biological Compatibility and Toxicity		
	Materials which come into contact with the human body shall be assessed for biocompatibility using the guidance given in EN ISO 10993-1. The assessment shall take into account the intended use and contact by those	Test material: seat canvas Test lab: HYG CEN GmbH Test standard: DIN EN ISO 10993-5	P

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	involved in user care or transportation and storage of the product.	Test report no.: SN 3885 II Test material: Dartex Grau Test lab: Medical Device Services Test standard: EN ISO 10993-5 Test report no.:041861-20 Test material: Pluesch Grau Prima Test lab: HYG CEN GmbH Test standard: DIN EN ISO 10993-5 Test report no.: SN 3959 II Test material: Armrest cushions Test lab: HYG CEN GmbH Test standard: DIN EN ISO 10993-5 Test report no.: SN 1581 IV	
	Contamination and residues		
	The requirements given in 5.3.1do not apply to the body fluids which may be collected in an aid (e.g. stomacare products) but only to those substances which are an integral part of an aid or are needed for its function (e.g. oil and grease) **Substances which may leak from an aid in intended use and in fault conditions** Substances which may leak from the aid shall either:		N
	a) be assessed for biocompatibility in accordance with the guidance given in EN ISO 10993-1. The assessment shall take into account the intended use and contact by those involved in user care, transport and storage; or		N
	b) be provided with protection that minimizes the possibility of such substance becoming a biological hazard		N
	Infection and micro-biological contamination		
	Cleaning and disinfecting		
	If an aid is intended to be cleaned, the method and suitable cleaning materials shall be described in the information supplied by the manufacturer. If an aid is intended to be disinfected, the method and suitable materials shall be described in the information supplied by the		P

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	manufacturer.		
	Animal Tissue		
	Manufacturers shall document the risk assessment of the product according to prEN 12442-1:1998 and shall incorporate the results in the risk assessment (see 6.1)		N
	Overflow, spillage, leakage and ingress of liquids		
	Overflow		
	If an aid incorporates a reservoir or liquid storage chamber that may be overfilled or may overflow in the manufacturer's intended use, liquid overflowing from the reservoir or chamber shall not wet electrical insulation and live parts which are liable to be adversely affected by such a liquid, nor shall a safety hazard be created. Unless restricted by a marking or by the instructions for use, no safety hazards shall develop if aids are tilted through an angle of 15° from the position of intended use.		N
	Spillage		
	Aids requiring the use of liquids in the manufacturer's intended use shall be so constructed that spillage does not wet parts which may cause a safety hazard in the product.		N
	Leakage		
	Aids shall be so constructed that liquid which might escape in single fault condition does not cause a safety hazard.		N
	Ingress of liquids		
	The hazards that can be caused by the ingress of liquids to non-electricallypowered aids shall be assessed in the risk analysis.		
	Safety of moving parts		
	Unless the intended purpose of an aid, or part of an aid, is to grip, cut, squeeze etc.: or if the intended use cannot be achieved without a hazard such as risk of squeezing (e.g. the elbow or knee flexion of a limb prosthesis):		
	a) any moving parts that constitute a safety hazard shall be provided with guards that can only be removed by the use of a tool;		N
	or b) the gap between exposed parts of an aid that move relative to each other shall be maintained throughout the range of movement at less than the minimum value or more than the maximum value set out in table 1.		P

Product Service

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	Table1: Safe distances between moving parts		P

To avoid	Safe distances for adults	Safe distances for children	Result - Remark
Finger traps	< 8 mm or > 25 mm	< 4 mm or > 25 mm	P
Foot traps	< 35 mm or > 120 mm	< 25 mm or > 120 mm	N
Head traps	< 120 mm or > 300 mm	< 60 mm or > 300 mm	N
Genitalia traps	< 8 mm or > 75 mm	< 8 mm or > 75 mm	N

	c) if cords (ropes), chains and drive belts are used, they shall either be confined so that they cannot run off or jump out of their guiding devices, or a safety hazard shall be prevented by other means. Mechanical means applied for this purpose shall be removable only by the use of a tool;		N
	or d) the aid shall incorporate a control device which initiates the movement when it is operated and stops the movement when it is released (e.g. a spring loaded control device that returns to the stop position when released);		N
	or e) the aid shall incorporate a means for detecting that a person is in danger of being trapped and automatically activating a means of preventing injury (e.g. by stopping movement);		N
	or f) the aid shall incorporate a control device which initiates a small movement when it is operated and which then stops and requires further initiation for each subsequent increment of movement.		N
	If the intended purpose of an aid cannot be met without a hazard such as squeezing, a warning and instructions on how to operate the aid safely shall be provided in the manufacturer´s instructions.		P
	Parts subject to mechanical wear likely to result in a safety hazard shall be accessible for inspection.		P
	If an aid incorporates an emergency stop feature, it shall conform to the requirements of EN 418.		N
	Prevention of traps for parts of the human body		

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Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	Holes in and clearances between stationary parts that are accessible to the user and/or assistant during the intended use of an aid shall be as specified in table 2. If the intended purpose of an aid cannot be met without a hazard caused by the size of holes and the clearance between moving parts, a warning and instructions on how to operate the aid safely shall be provided in the manufacturer's instructions.		P
	Table 2: Safety distances between stationary parts		P

To avoid	Safe distances for adults	Safe distances for children	Result - Remark
Finger traps	< 8 mm or > 25 mm	< 4 mm or > 12 mm	P
Foot traps	< 35 mm or > 120 mm	< 25 mm or > 45 mm	N
Head traps	< 120 mm or > 250 mm	< 60 mm or > 150 mm	N
Genitalia traps	< 8 mm or > 75 mm	< 8 mm or > 75 mm	N

	Folding and adjusting mechanisms		
	If an aid incorporates folding and/or adjusting mechanisms it shall conform to A) and B) **A)** The mechanisms shall be capable of being securely locked when the aid is in any fixed working configuration.		P
	B) Either a) the aid shall incorporate guards to protect the user from trap and/or squeeze hazards;		N
	or b) the gap between exposed parts of an aid that move relative to each other shall be maintained throughout the range of movement at less than the minimum value or more than the maximum value set out in table 1;		P
	or c) if the intended purpose of an aid cannot be met without a hazard such as squeezing, a warning and instructions on how to operate the aid safely shall be provided in the manufacturers instructions.		P
	Surfaces, corners and edges		
	If not required for the intended function of an aid, all accessible edges, corners and surfaces shall be smooth and be free from burrs and sharp edges. If not required for the intended function, aids shall not have projections. Where possible		P

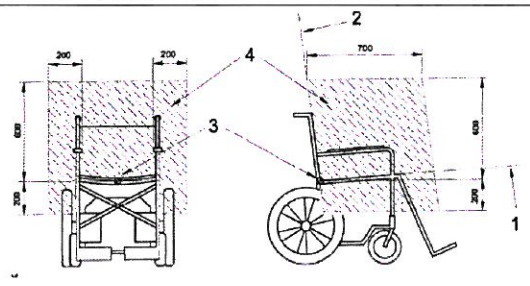
Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	necessary projections shall have protection to prevent injury and/or damage.		
	Electronic programmable systems		
	Aids which are required to comply with the requirements of EN 60601-1:1987 (8.1a) and which have an electronic programmable system shall comply with the requirements of EN 60601-1-4.		P
	Clinical evaluation		
	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 540:1993		P
	Ergonomics		
	An aid shall be designed to the ergonomic principles set out in EN 614-1 taking into account the special needs of the disabled person for whom the device is intended.		P
	Risk analysis acc. to EN ISO 14971		
	The safety of an aid shall be assessed by identifying hazards and estimating the risks associated with them using the procedure specified in EN ISO 14971 supplemented by the requirements of 5.2, 5.4.2, 5.5, 6, 8.2.1, 9.4, 10, 22 and 24.		
	Biocompatibility and toxicity (5.2)		P
	Resistance to corrosion (5.5)		P
	Noise and vibration (6)		P
	Battery housings (8.2.1)		P
	Ingress of liquids (9.4)		P
	Surface temperature (10)		P
	Ergonomic principles (22)		P
	Packaging (24)		P
7	**Design requirements**		
7.1	**Foot supports, lower leg supports and arm supports**		
	The wheelchair shall be fitted with foot supports that have a means of positioning the occupant's feet at the required height, that prevent the user's feet from sliding backwards and that shall meet the performance requirements specified in 8.2. Where fitted, lower leg supports and arm supports shall meet the performance requirements specified in 8.2.		P
7.2	**Pneumatic tyres**		

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	If the wheelchair is fitted with pneumatic tyres, they shall have the same type of valve connection on all tyres.		P
	The tyres or the rims shall be marked with the maximum pressure in kPa or bar.		P
7.3	**Fitting an anterior pelvic support**		
	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
7.4	**Wheelchairs for use as seats in motor vehicles**		
	If the manufacturer specifies that the intended use of the wheelchair includes use by an adult as a seat in a motor vehicle, the wheelchair shall conform to the performance requirements of ISO 7176-19.		P
	If the manufacturer specifies that the intended use of the wheelchair includes use as a seat in a motor vehicle by a child of mass greater than 22 kg, the wheelchair shall conform to the performance requirements of ISO 7176-19 with the exception of the horizontal excursion limits and the selection of the Anthropomorphic Test Device (ATD). The horizontal excursion limits specified in Table 1 of ISO 10542-5:2004 and the ATD selection specified in Table A.1 of ISO 10542-5:2004 shall apply.		N
7.5	**Braking systems**		
	The wheelchair shall be fitted with a braking system that meets the performance requirements specified in 8.4.		P
	If one or more brake levers are fitted to a wheelchair in the form used on bicycles and mopeds, the hand-grip width of such brake levers, measured 15 mm from the end of the brake lever, shall not be greater than 75 mm before a force is applied. See Figure 3.		N
7.6	**Freewheel device** 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,		P
	• be within the reach specified in Figure 2, if it is intended to be operated by the occupant,		P
	• have operating forces for engaging and disengaging that do not exceed those stated		P

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	in Table 1		
	• 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 any part of the freewheel device is activated.		P
7.7	**Component mass**		
	If the wheelchair is intended to be dismantled for storage or transportation, any component that requires moving or handling and 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 it can be lifted and describe how it shall be handled during disassembling, lifting, carrying, and assembling to reduce risks to the person or persons moving or handling the equipment.		P
7.8	**Battery enclosures and containers** Battery enclosures and containers shall		
	a) allow accessibility without the use of tools for inspection and service specified by the wheelchair manufacturer,		P
	b) 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
	c) provide protection to stop any objects contacting the terminals of batteries and/or cells and the connections between them, to prevent a short circuit.		P
	Battery enclosures shall be ventilated at the side near to the highest point by an opening or openings which have a total area not less than 100 mm² or as specified in 6.6.2 of EN 50272-3:2002 whichever is the greater.		P
	Battery containers shall		
	d) be used where spillable batteries are fitted to the wheelchair,		P
	e) be resistant to corrosion caused by battery gases and acid.		P
7.9	**Operations intended to be carried out by the occupant and/or assistant**		

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	Wheelchairs shall be designed to facilitate ease of operation by the occupant and/or assistant as specified in the manufacturer's instructions and meet the performance requirements of 8.2.1, 8.5, 8.6.1, 8.7.1, 8.9, 8.12.1,9.2 and 9.3. In addition, brake levers shall meet the applicable requirements of 8.4.1. Examples include: • operation of adjustable seating, • use of detachable components, including removable arm supports, lower leg supports etc., to facilitate safe transfers into and out of the wheelchair, • use of folding mechanisms, including folding frames etc., to facilitate storage and transportation of unoccupied wheelchairs, • carrying out maintenance, including use of tools etc., • use of manual steering controls, • use of braking systems and freewheel devices, • use of assistant controls, • . use of control devices.		P
7.10	**Controls intended for operation by the occupant**		
	Controls intended to be operated by the occupant while seated shall be within the occupant reach as shown in Figure 2. • on/off switch or key, • . speed regulator, • . speed pre-setting, • . running brake, • . parking brake, • . audible warning device, • . direction indicator, • . direction switch, • . control device, • . manual steering controls, • . lighting controls, • . seating adjustments, • . detachable components, including removable arm supports, lower leg supports etc., to facilitate safe transfers into and out of the wheelchair, • steering controls, • . freewheel device.		P

Product Service

Clause --- *Prüfpunkt*	Requirement + Test --- *Anforderung + Prüfung*	Result - Remark --- *Ergebnisse – Bemerkungen*	Verdict *Wertung*
	 Key 1 seat reference plane 2 back support reference plane 3 seat reference point 4 occupant reach for electrically powered wheelchair **Figure 2 — Occupant reach for electrically powered wheelchair**		
7.11	**Assistant control unit, push handles and handgrips**		
	When fitted, an assistant control, push handles and handgrips shall meet the performance requirements specified in 8.6.		N
7.12	**Charging connector**		
7.12	The wheelchair shall be fitted with a charging connector that meets the performance requirements specified in 8.7.		P
8	**Performance requirements**		
8.1	**General** Unless otherwise specified in this clause, the wheelchair shall be prepared as specified in ISO 7176-22 for each test.		
8.2	**Foot supports, lower leg supports assemblies or arm supports**		
8.2.1	**Requirements** Any swing away, movable or removable foot support, lower leg support assembly or arm support fitted on the wheelchair shall		
	a) incorporate a means to fix it securely in any operating position,		P
	b) be adjustable in increments not exceeding 25 mm,		P
	c) be accessible and operable by the occupant or an assistant or both in accordance with the manufacturers intended usage and within the reach space shown in Figure 2, and		P
	d) be operable without the use of tools.		P
	When tested as specified in 8.2.2.2, separate foot supports shall have a gap between them that		
	- does not exceed 35 mm if the wheelchair is intended to be occupied by an adult,	D: 50 mm means to prevent the occupant's feet from sliding into the gap are available	F-C

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	- does not exceed 25 mm if the wheelchair is intended to be occupied by a child, or	D --	N
	- that is fitted with a means to prevent the occupant's feet from sliding into the gap.		P
8.3	**Static, impact and fatigue strength**		
	a) No component shall be fractured or have visible cracks.		P
	b) No nut, bolt, screw, locking-pin, adjustable component or similar item shall have become detached after having been tightened, adjusted or refitted once. However, in addition, footrests may be adjusted after each of the two footrest impact tests.		P
	c) No electrical connector shall be displaced or disconnected.		P
	d) All parts intended to be removable, folding or adjustable shall operate as described by the manufacturer.		P
	e) All power-operated systems shall operate as described by the manufacturer.		P
	f) Handgrips shall not be displaced.		P
	g) Any multiposition or adjustable component shall not be displaced from the presen t position, except as permitted in b)		P
	h) No component or assembly of parts shall exhibit deformation, free play or loss of adjustment that adversely affects the function of the wheelchair.		P
	Armrests: resistance to downward forces The force mentioned below or - if the manufacturer claims that the wheelchair exceeds the appropriate minimum requirement a force claimed to ± 3 % - is applied for 5 s to 10 s.		P
	Footrests: resistance to downward forces The force mentioned below or - if the manufacturer claims that the wheelchair exceeds the appropriate minimum requirement a force claimed to ± 3% - is applied for 5 s to 10 s.		P

Maximum user mass [kg]	Force to be applied to each armrest [N]
160	1218

Max mum user mass [kg]	Force to be applied to footrests [N]
160	1569

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	Tipping levers: resistance to downward forces The force as described below is applied on the tipping lever 25 ± 5 mm away from its end for 5 s to 10 s.		N

Maximum user mass [kg]	Force to be applied to each tipping lever [N]
160	1000

	Handgrips: resistance to pull off forces The force as described below is applied for 5 s to 10 s in an axial way. Radial forces are to be avoided.		N

Maximum user mass [kg]	Force to be applied to each handgrip [N]
160	750

	Armrests: resistance to upward forces The force mentioned below or - if the manufacturer claims that the wheelchair exceeds the appropriate minimum requirement a force claimed to ± 3% - is applied for 5 s to 10 s.		P

Maximum user mass [kg]	Force to be applied to each armrests [N]
160	1000

	Footrests: resistance to upward forces The force mentioned below or - if the manufacturer claims that the wheelchair exceeds the appropriate minimum requirement a force claimed to ± 3% - is applied for 5 s to 10 s.		P

Maximum user mass [kg]	Each side structure [N]	Centre of one-piece footrests [N]
160	1081	--

	Push handles: resistance to upward forces The force mentioned below or - if the manufacturer claims that the wheelchair exceeds the appropriate minimum requirement a force claimed to ± 3% - is applied for 5 s to 10 s.		P

Maximum user mass [kg]	Each single push handle [N]	Centre of bar-type handle [N]
160	--	2000