

4Wheler

KFN Aps

Testing report

Bimanual rear-wheel-driven wheelchair

ver 2008-01-31



Hjälpmedelsinstitutet  
Testing Laboratory  
Dnr: 08/0039

4Wheeler  
2009-02-09



## RAPPORT

utfärdad av ackrediterat laboratorium  
REPORT issued by an Accredited Laboratory

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**MANUAL WHEELCHAIRS**  
**Summary of Technical Tests**

**Product name:** 4Wheler  
**ISO-code:** 12 22 18

**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Manufacturer:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark



The wheelchair has been tested in accordance with EN 12183:1999(E) including ISO 7176-1, ISO 7176-3 and ISO 7176-8

The tested wheelchair had a seat width of 43,5 cm and was equipped with the following elements (nomenclature as in ISO 6440): Bar type handle.

During the tests adjustable parts were adjusted for driving according to the clients recommendations. For further information see "Identification List Part 1 and 2".

The tests was performed with a 80 kg test dummy in accordance with ISO 7176-11.

**This report consist of 11 parts and 28 pages.**

**Test results:** The wheelchair pass all applicable requirements given in the standards enumerated above. The wheelchair fulfills the Swedish Institute of Assistive Technology's specification of requirements for Manually-propelled wheelchairs. All results concern the tested products only.

Swedish Institute of Assistive Technology

2009-02-09

Issued by:

Gabrielle van der Wal, Test engineer

Approved by:

Jennie Josefsson, Head of Testing Laboratory

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Dnr: 08/0039 :02      2009-02-09



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**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Manufacturer:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Product name:** 4Wheler      **Serial No:** CVR26932165  
**Test load:** 80 kg

**Code according to ISO 9999:** Bimanual rear-wheel-driven wheelchair  
12 22 18

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object received:** 2008-02-01      The test objects have been selected by the client  
without SIAT's assistance.

**Test started:** 2008-02-13  
**Test ended:** 2008-08-13

**Test method:** Manually propelled wheelchairs

**Summary of test** Pass

**Deviations, additions or exceptions from the test specification:** Some test methods not accredited

The wheelchair fulfills the Swedish Institute of Assistive Technology's specification of requirements for Manually-propelled wheelchairs.

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1126

ISO/IEC 17025

Test procedure (EN/ISO)	Comments
<u>6. Design requirements</u> EN 12183:1999; 7.5, C.2.6 Pushing force	part :06 Note 1
ISO 7176-1:1999(E) Determination of static stability	part :07 and 08
<u>7. Performance requirements</u> ISO 7176-8:1998 Requirements and test methods for static, impact and fatigue strength	part :09 Note 2
ISO 7176-3:2003 Determination of the effectiveness of brakes EN 12183:1999; 7.2 Parking brake fatigue strength	part :10
EN 12183:1999; 7.6 Tracking characteristic	part :11

Remarks: No remarks.

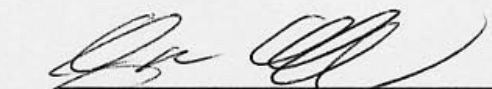
Note 1: The test is performed with approved result, but the test method is not accredited by SWEDAC.

Note 2: Drop test performed with approved result, but the test method is not accredited by SWEDAC.

All results concern the tested products only.

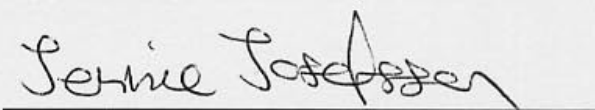
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Gabrielle van der Wal, Test engineer

Approved by:



Jennie Josefsson, Head of Testing Laboratory

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**Product name:** 4Wheler  
**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**IDENTIFICATION LIST - Part 1**

**CLIENTS INFORMATION ABOUT THE TEST OBJECT**

<b>Maximum user weight:</b>	80 kg		
<b>Maximum width:</b>	68 cm	<b>Maximum length:</b>	147 cm
<b>Maximum height:</b>	98 cm	<b>Maximum weight:</b>	13,2 kg

**Equipment included in the test object**

**Propelled wheel <sup>1</sup>**

- Wheel type: (I.e. Spoked, Disk wheel)
- Tyre type: (I.e. Solid, Pneumatic)
- Tyre dimensions:
- Axle type: (I.e. Fixed, Quick release)
- Position: (I.e. Adjustable, Not adjustable)

**Comments**

Spoked  
Pneumatic  
  
47-355 (18 x 1,75)  
  
Quick release  
Not adjustable

**Castors <sup>2</sup>**

- Wheel type: (I.e. Spoked, Disk wheel)
- Tyre type: (I.e. Solid, Pneumatic)
- Tyre dimensions:
- Castor fork shaft angle: (I.e. Adjustable, Not adjustable)

Spoked  
Pneumatic  
17-305 (16 x 1,75)  
Not adjustable

**Backrest**

- (I.e. Adjustable, Not adjustable)
- (I.e. Removable, Fixed)
- (I.e. Folding, Non folding)
- (I.e. Push handles, No push handles)

Not adjustable  
Fixed  
Non folding  
Push bar

<sup>1</sup> Transport wheelchair: Rear wheel  
<sup>2</sup> Transport wheelchair: Front wheel

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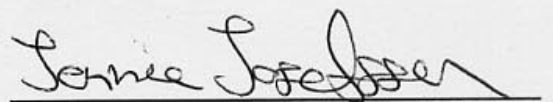
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Approved by:



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**Product name:** 4Wheler  
**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**IDENTIFICATION LIST - Part 2**

**Preparation of the test wheelchair:**

- If the wheelchair has a rigid seat fit the thinnest cushion recommended by the client. If the wheelchair is fitted with a seat consisting of a single membrane of flexible material, remove any cushions, including cushions that are attached by touch and close fasteners ("Velcro" is a typical touch and close fastener).
- If the wheelchair has pneumatic tyres, inflate them to the pressure recommended by the client. If a pressure range is given inflate to the highest pressure in the range. If there is no recommendation for inflation pressure from the client, inflate the tyres to the maximum pressure recommended by the tyre manufacture.

**Adjustments:**

- Position parts to any client's recommendations for driving (Table 1).
- For parts where there are no client's recommendations for driving:  
Set the adjustable parts of the wheelchair so that as many as possible of the settings in table 2 are achieved with priority given to those earliest in the sequence.

**Table 1**  
(Client's recommendations for setting adjustable parts)

Pos	Adjustable part	Adjustments	Comments
	Air pressure	front 3 bar, rear 3 bar	ok
a)	Castor stem	Not adjustable	n.a
b)	Body support system	Not adjustable	n.a
c)	Seat	Not adjustable	n.a
d)	Backrest	Not adjustable	n.a
e)	Foot supports	Not adjustable	n.a
f) g)	Wheel camber	Not adjustable	n.a
h)	Drive wheel position, horizontally	Not adjustable	n.a
i)	Drive wheel position, vertically	Not adjustable	n.a
j)	Castor assemblies, horizontally	Not adjustable	n.a
k)	Castor assemblies, vertically	Not adjustable	n.a
l)	Width between castors	Not adjustable	n.a
m)	Castor wheel height	Not adjustable	n.a
n)	Leg support/footrest	Not adjustable	n.a
o)	Other components	N.a	n.a
p)	Fasteners	Check that any fasteners that have been affected during the set up procedure are secured to the manufacturer's specification.	ok



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**Table 2**  
(No client's recommendations for setting adjustable parts)

Pos	Adjustable part	Adjustments	Comments
	Air pressure		N.a
a)	Castor stem	Set any castor stem vertical with a tolerance of $+0^\circ / -1^\circ$ or if this is not possible to the nearest position to vertical in the negative direction.	N.a
b)	Body support system	If the body support system's relative to the frame can be adjusted horizontally and/or vertically set at the mid position or, where there is no provision for a middle setting the nearest to the rear of or below the mid position $\pm 5$ mm respectively.	N.a
c)	Seat	Set adjustable seats so that the seat plane angle as determined in ISO 7176-7 slopes at $8^\circ \pm 1^\circ$ to the horizontal with its forward edge higher than the rear. If this angle is not possible to achieve adjust to the nearest greater angle, or, if this angle also is impossible to achieve to the nearest angle to $8^\circ$ .	N.a
d)	Backrest	Set adjustable backrests so that the backrest angle as determined by the method specified in ISO 7176-7 is at $10^\circ \pm 1^\circ$ to vertical with the top behind the bottom. If this angle is not possible to achieve adjust to the nearest greater angle, or, if this angle also is impossible to achieve to the nearest angle to $10^\circ$ .	N.a
e)	Foot supports	Position adjustable foot supports so that the leg to seat surface angle as specified in ISO 7176-7 is as close as possible to, but not less than $90^\circ$ .	N.a
f) g)	Wheel camber	Set wheels with adjustable camber to the mid position between vertical and maximum negative camber, or where there is no provision for a middle setting the nearest mid position with greater angle of camber. If there is no pre-determined range of camber, set the wheels to $2^\circ \pm 1^\circ$ negative camber. If this is not possible set to the nearest greater angle.	N.a

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h)	Drive wheel position, horizontally	If the position of the drive wheels can be adjusted horizontally set them in the mid position $\pm 3$ mm or, where there is no provision for a middle setting, the nearest position to the rear of the middle. Note: Do not use settings specially intended by the manufacturer for use by amputees unless this setting is the only setting available.	N.a
i)	Drive wheel position, vertically	If the position of the drive wheels can be adjusted vertically set them to the mid position $\pm 3$ mm or, where there is no provision for a middle setting the nearest position below the middle.	N.a
j)	Castor assemblies, horizontally	If the position of castor assemblies can be adjusted horizontally set them in the mid position $\pm 3$ mm or, where there is no provision for a middle setting the nearest position forward of the middle.	N.a
k)	Castor assemblies, vertically	If the position of castor assemblies can be adjusted vertically set them in the mid position $\pm 3$ mm or, where there is no provision for a middle setting, the nearest position below the middle.	N.a
l)	Width between castors	If the width between castors can be adjusted set it to its maximum value.	N.a
m)	Castor wheel height	If the position of any castor wheel is adjustable for height in the castor fork set to the mid position $\pm 3$ mm or where there is no mid position, the nearest position to the middle which gives the greater distance between fork and wheel.	N.a
n)	Leg support/footrest	Position the lowest part of the leg support/footrest as close as possible to, but not less than 50 mm above the test plane.	N.a
o)	Other components	Set any remaining physical adjustments as near as possible to their mid position which gives the larger dimension of the adjustments with tolerances of $\pm 1^\circ$ or $\pm 3$ mm.	N.a
p)	Fasteners	Check that any fasteners that have been affected during the set up procedure are secured to the manufacturer's specification.	N.a

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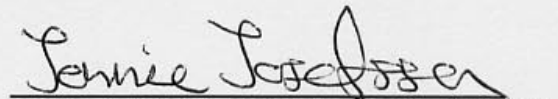
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This report was issued: 2009-02-09

Issued by:

  
\_\_\_\_\_  
Gabrielle van der Wal, Test engineer

Approved by:

  
\_\_\_\_\_  
Jennie Josefsson, Head of Testing Laboratory

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## RAPPORT

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**Product name:** 4Wheler  
**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

### PRE- and POST-CHECK LIST

The wheelchair shall be inspected before and after the test procedures in order to note any failure on removal and exchange of detachable components and function of adjustable components.

	<b>Before the test Procedures</b>	<b>After the test Procedures</b>
<b>Parking brakes</b>	ok	ok
<b>Fold ability</b>	ok	ok
<b>Removal and exchange of detachable components</b>		
- Armrests	n.a	n.a
- Footrests	ok	ok
- Main wheels	ok	ok
- Castors	ok	ok
- Side support	ok	ok

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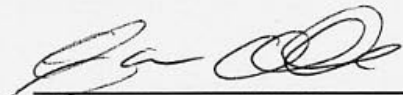
**Adjustability of components**

- Footrest	ok	ok
- Leg length	ok	ok
- Backrest	ok	ok
- Backrest angle	ok	ok
- Armrest height	n.a	n.a
- Main wheel Position	ok	ok
- Anti tip device	ok	ok
- Other	ok	ok

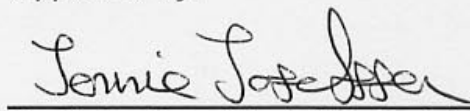
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This report was issued: 2009-02-09

Issued by:

  
Gabrielle van der Wal, Test engineer

Approved by:

  
Jennie Josefsson, Head of Testing Laboratory

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Testing Laboratory  
Dnr: 08/0039 :06 2009-02-09

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**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Manufacturer:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Product name:** 4Wheler

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object:** The test conditions of the wheelchair are found in the IDENTIFICATION LIST - Part 1 and Part 2.

**Test object received:** 2008-02-01

**Test started:** 2008-02-13

**Test ended:** 2008-06-30

**Test method:** Pushing force  
EN 12183:1999; 7.5, C.2.6  
March 1999

**Summary of test:**

**Deviations, additions or exceptions from the test specification:** None

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Test procedure in accordance to EN 12183 pagination in accordance to EN 12183	Test conditions and results
<p>Test dummie or human test driver Test load</p> <p><b>7.5 Pushing force</b> Before fatigue test</p> <p>7.5.2 Starting force Constant speed at 1 m/s</p> <p>After fatigue test</p> <p>7.5.2 Starting force Constant speed at 1 m/s</p>	<p>Test dummie 80 kg</p> <p>19 N 11 N</p> <p>20 N 14 N</p>

Remarks:

No remarks.

Measuring uncertainly:

Air pressure:

± 0,1 bar

Linear measurements:

± 5 mm


Forces:

± 5 N

All results concern the tested products only.

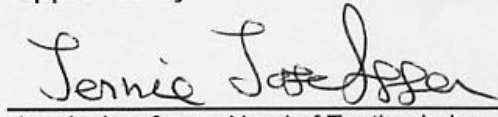
This report was issued: 2009-02-09

Issued by:



Gabrielle van der Wal, Test engineer

Approved by:



Jennie Josefsson, Head of Testing Laboratory

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**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Manufacturer:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Product name:** 4Wheler

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object received:** 2008-02-01  
**Test started:** 2008-08-13  
**Test ended:** 2008-08-13

<b>Test method:</b>	Determination of static stability ISO 7176-1:1999(E) 1999-10-01	
<b>Summary of test:</b>	Minimum slope with anti-tip device	20° Test load: 80 kg
	Pass	
<b>Deviations, additions or exceptions from the test specification:</b>	Clause 11. Ground clearance of the anti-tip device, minimum 15 mm.	
<b>Test procedure in accordance to ISO 7176-1</b> pagination in accordance to ISO 7176-1	<b>Test conditions and results</b>	
5. Test equipment	HIs inv.nr. 002180	
5.1 Test plane	100 mm high obstacle	
5.3 Means to prevent the wheelchair to roll	100 mm high obstacle	
5.4 Means to prevent the wheelchair to slide	HIs inv.nr. 002162	
5.6 Means to measure the angle		
6. Preparation of the wheelchair	According ID-LIST	
8. Test dummie or human test driver	Test dummie	
Test load.	80 kg	

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Stability Direction		Tipping angle					
		Least stable		Most Stable			
9.	Forward	Front wheels locked		n.a.	n.a.		
		Front wheels unlocked		20°	20°		
10.	Rear	Rear wheels locked		8°	8°		
		Rear wheels unlocked		13°	13°		
11.		Antitip devices*		20°	20°		
12.	Sideways	Left		20°	n.a.		
		Right		20°	n.a.		
* "least stable" and "most stable" refer to the positioning of the antitip devices.							
note:							
Table 1 - Forward stability							
		<b>Adjustable wheelchair component</b>		<b>Least stable</b>		<b>Most stable</b>	
		Rear-wheel position, fore-aft		forward	n.a.	back	n.a.
		Castor attachment to frame, fore-aft		back	n.a.	forward	n.a.
		Seat position, fore-aft		forward	n.a.	back	n.a.
		Seat position, vertical		high	n.a.	low	n.a.
		Seat back position, fore-aft		forward	n.a.	back	n.a.
		Seat back position, recline		upright	n.a.	back	n.a.
		Seat position, tilt		upright	n.a.	back	n.a.
		Elevating legrest position		up	n.a.	down	n.a.
Table 2 - Rearward stability							
		<b>Adjustable wheelchair component</b>		<b>Least stable</b>		<b>Most stable</b>	
		Rear-wheel position, fore-aft		forward	n.a.	back	n.a.
		Castor attachment to frame, fore-aft		back	n.a.	forward	n.a.
		Seat position, fore-aft		back	n.a.	forward	n.a.
		Seat position, vertical		high	n.a.	low	n.a.
		Seat back position, fore-aft		back	n.a.	forward	n.a.
		Seat back position, recline		back	n.a.	upright	n.a.
		Seat position, tilt		back	n.a.	upright	n.a.
11	Test for rearward static stability with rear antitip devices						
11.x.1	Set the rear wheel in the rearmost position						
11.x.2	Set other adjustable parts in accordance to table 2						
11.2.3	Set the anti tip device in the least stable configuration Distance from the ground:					60 mm	
11.3.3	Set the anti tip device in the most stable configuration Distance from the ground:					60 mm	

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Table 3 - Sideways stability

Adjustable wheelchair component	Least stable		Most stable	
	Rear-wheel position, camber	narrows track	n.a	widest track
Castor attachment to frame, fore-aft	back	n.a	forward	n.a.
Castor attachment to frame, inside-outside	inside	n.a	outside	n.a.
Seat position, fore-aft	forward	n.a	back	n.a.
Seat position, vertical	high	n.a	low	n.a.
Seat back position, recline	upright	n.a	back	n.a.
Seat position, tilt	upright	n.a	back	n.a.

Remarks:  
No remarks.


Measuring uncertainly according GUM and EA-4/16:

Angles:  $\pm 1,3^\circ$ , k=2

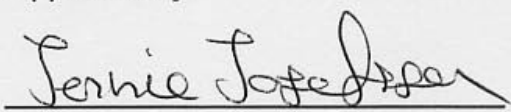
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DK 8300 Odder  
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**Manufacturer:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Product name:** 4Wheler

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object received:** 2008-02-01  
**Test started:** 2008-08-13  
**Test ended:** 2008-08-13

<b>Test method:</b>	Determination of static stability ISO 7176-1:1999(E) 1999-10-01	
<b>Summary of test:</b>	Minimum slope without anti-tip device	13° Test load: 60 kg
	Pass	
<b>Deviations, additions or exceptions from the test specification:</b>	Clause 11. Ground clearance of the anti-tip device, minimum 15 mm.	
<b>Test procedure in accordance to ISO 7176-1</b> pagination in accordance to ISO 7176-1	<b>Test conditions and results</b>	
5. Test equipment	HIs inv.nr. 002180	
5.1 Test plane	100 mm high obstacle	
5.3 Means to prevent the wheelchair to roll	100 mm high obstacle	
5.4 Means to prevent the wheelchair to slide	HIs inv.nr. 002162	
5.6 Means to measure the angle		
6. Preparation of the wheelchair	According ID-LIST	
8. Test dummie or human test driver	Test dummie	
Test load.	60 kg	

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Stability Direction			Tipping angle			
			Least stable		Most Stable	
9.	Forward	Front wheels locked	n.a.		n.a.	
		Front wheels unlocked	20°		20°	
10.	Rear	Rear wheels locked	13°		13°	
		Rear wheels unlocked	>20°		>20°	
11.		Antitip devices*	>20°		>20°	
12.	Sideways	Left	20°		n.a.	
		Right	20°		n.a.	
* "least stable" and "most stable" refer to the positioning of the antitip devices.						
note:						
Table 1 - Forward stability						
<b>Adjustable wheelchair component</b>			<b>Least stable</b>		<b>Most stable</b>	
Rear-wheel position, fore-aft			forward	n.a	back	n.a
Castor attachment to frame, fore-aft			back	n.a	forward	n.a
Seat position, fore-aft			forward	n.a	back	n.a
Seat position, vertical			high	n.a	low	n.a
Seat back position, fore-aft			forward	n.a	back	n.a
Seat back position, recline			upright	n.a	back	n.a
Seat position, tilt			upright	n.a	back	n.a
Elevating legrest position			up	n.a	down	n.a
Table 2 - Rearward stability						
<b>Adjustable wheelchair component</b>			<b>Least stable</b>		<b>Most stable</b>	
Rear-wheel position, fore-aft			forward	n.a	back	n.a
Castor attachment to frame, fore-aft			back	n.a	forward	n.a
Seat position, fore-aft			back	n.a	forward	n.a
Seat position, vertical			high	n.a	low	n.a
Seat back position, fore-aft			back	n.a	forward	n.a
Seat back position, recline			back	n.a	upright	n.a
Seat position, tilt			back	n.a	upright	n.a
11 Test for rearward static stability with rear antitip devices						
11.x.1 Set the rear wheel in the rearmost position						
11.x.2 Set other adjustable parts in accordance to table 2						
11.2.3 Set the anti tip device in the least stable configuration Distance from the ground:			60 mm			
11.3.3 Set the anti tip device in the most stable configuration Distance from the ground:			60 mm			

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Table 3 - Sideways stability

Adjustable wheelchair component	Least stable		Most stable	
	narrowest track	n.a	widest track	n.a.
Rear-wheel position, camber	back	n.a	forward	n.a.
Castor attachment to frame, fore-aft	inside	n.a	outside	n.a.
Castor attachment to frame, inside-outside	forward	n.a	back	n.a.
Seat position, fore-aft	high	n.a	low	n.a.
Seat position, vertical	upright	n.a	back	n.a.
Seat back position, recline	upright	n.a	back	n.a.
Seat position, tilt				

Remarks:  
No remarks.

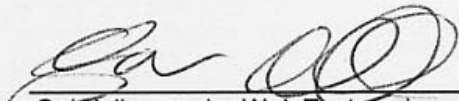
Measuring uncertainly according GUM and EA-4/16:

Angles:  $\pm 1,3^\circ$ , k=2

All results concern the tested products only.

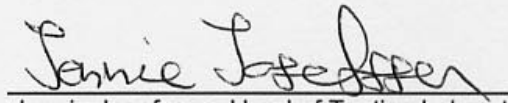
This report was issued: 2009-02-09

Issued by:



Gabrielle van der Wal, Test engineer

Approved by:



Jennie Josefsson, Head of Testing Laboratory

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Hjälpmedelsinstitutet

Testing Laboratory

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## RAPPORT

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**Client:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Manufacturer:** KFN Aps  
Bondesvadvej 15  
DK 8300 Odder  
Danmark

**Product name:** 4Wheler

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object:** The test conditions of the wheelchair are found in the IDENTIFICATION LIST - Part 1 and Part 2.

**Test object received:** 2008-02-01

**Test started:** 2008-02-22

**Test ended:** 2008-03-06

**Test method:** Requirements and test methods for static, impact and fatigue strength  
ISO 7176-8:1998  
1998-07-15

**Summary of test:**

**Deviations, additions or exceptions from the test specification:** 10.5 Annotation

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Test procedure in accordance to ISO 7176-8 pagination in accordance to ISO 7176-8	Test conditions and results
<p><b>Preparation</b> Dummy weight: Total weight (incl. dummy): Weight distribution on wheels rear/front:</p>	<p>80 kg 97 kg 84 kg / 13 kg</p>
<p><b>Results</b> <b>8 Static strength</b></p>	
<p>8.4 Armrest - downward 15° outwards Load F1 in N: Right armrest: Left armrest:</p>	<p>609 N na na</p>
<p>8.5 Footrests - downward Load F2 in N: Right footrest: Left footrest: One piece footrest:</p>	<p>785 N na na na</p>
<p>8.6 Tipping levers (equivalents) - downward Load F3 in N: Right tipping lever: Left tipping lever:</p>	<p>1 300 N na na</p>
<p>8.7 Handgrips - axial Load F4 in N: Right handgrip: Left handgrip:</p>	<p>765 N na na</p>
<p>8.8 Armrests - upwards 10° outwards Load F5 in N: Right armrest: Left armrest:</p>	<p>747 N na na</p>
<p>8.9 Footrests - upwards Load F6 in N: Right footrest: Left footrest: One piece footrest:</p>	<p>370 N na na na</p>
<p>8.10 Push handles - upward Load F7 in N: Right push handle: Left push handle: Bar type handle:</p>	<p>735 N na na ok</p>



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<b>9</b>	<b>Impact strength</b>		
9.3	Backrest	Angle of swing:	30°
	Centre pivoted backrest		
	At the centre of the backrest:		na
	At a point 0,4 x the backrest with from the centre line of the backrest:		na
	Other type of backrest		
	At the centre of the backrest 30 mm from the top:		ok
	Backrest with mounted on two supporting members		
	At the right supporting member 30 mm from the top of the backrest:		na
	At the left supporting member 30 mm from the top of the backrest:		na
9.4	Hand rim	Angle of swing:	45°
	With the pendulum impact in line with the attachment point:		na
	With the pendulum impact between two attachment points:		na
9.5	Castors	Angle of swing:	42°
	Right castor:		ok
	Left castor:		ok
9.6	Footrests	Angle of swing:	42°
	Lateral right:		na
	Lateral left:		na
	Longitude right:		na
	Longitude left:		na
<b>10.4</b>	<b>Two-drum test</b>		
	<b>Preparation</b>		
	Attachments of the wheelchair on the Double Drum:	Pull rods attached between the frame in the nearness of the main wheel position and the machine. Straps between the front and rear part of the wheelchair to prevent sideways movement.	
	Method for tightening the dummy:	Straps between the fulcrum of the dummy and the W/C frame. Straps between the dummy and the frame as well as between the dummy and the backrest to prevent sideways movement. A link on each side of the dummy between the seat trunk and the backrest trunk. The links permits the backrest section to move $\pm 2^\circ$ . The footrest weights are fixed to the footrest with bolts.	
	<b>Results</b>		
	Total number of cycles:		200 000

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<b>10.5 Drop test Preparation</b>	
Attachments of the wheelchair on the Drop Test:	Same as 10.4 Two-drum test
Method for tightening the dummy:	Same as 10.4 Two-drum test
<b>Results</b>	
Total number of cycles:	6 666
<b>Annotation</b>	Drop test performed with approved result, but the test method is not accredited by SWEDAC.


Remarks: No remarks

Measuring uncertainly according GUM and EA-4/16: Angles:  $\pm 1^\circ$ , k=2  
Force:  $\pm 5$  N, k=2


All results concern the tested products only.

This report was issued: 2009-02-09

Issued by:

  
Gabrielle van der Wal, Test engineer

Approved by:

  
Jennie Josefsson, Head of Testing Laboratory

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DK 8300 Odder  
Danmark

**Manufacturer:** KFN Aps  
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DK 8300 Odder  
Danmark

**Product name:** 4Wheler

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object:** The test conditions of the wheelchair are found in the IDENTIFICATION LIST - Part 1 and Part 2.

**Test object received:** 2008-02-01  
**Test started:** 2008-02-13  
**Test ended:** 2008-03-10

<b>Test method:</b>	Determination of the effectiveness of brakes ISO 7176-3:2003 2003-04-15	
<b>Summary of test:</b>	Minimum slope	>15°
	Pass	
<b>Deviations, additions or exceptions from the test specification:</b>	None	
<b>Test method:</b>	Parking brake fatigue strength EN 12183:1999; 7.2	
<b>Summary of test:</b>	Pass	
<b>Deviations, additions or exceptions from the test specification:</b>	None	



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Test procedure in accordance to EN 12183 pagination in accordance to EN 12183	Test conditions and results
<p>Test equipment Equipment for parking brake fatigue strength Frequency not exceeding 0,5 Hz.</p> <p><b>6.6.1 Requirements for parking brakes</b></p> <p>Do the brakes have provision for adjustment to compensate for any wear to any friction surfaces, tyres etc. that have worn to the point of replacement as recommended in the manufacturer's documentation and for any wear occurring during the tests specified in 7.2.2 and 7.2.4?</p> <p><b>7.2.4 Test method for parking brake fatigue strength</b></p> <p>Tested brake</p> <p><b>Results</b>            Total number of cycles:</p>	<p>Hls inv.nr 002188</p> <p>Pass</p> <p>left</p> <p>60 000</p>

Remarks:            No remarks


Measuring uncertainly according GUM and EA-4/16:            n.a.

All results concern the tested products only.

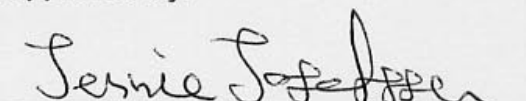
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Approved by:



Gabrielle van der Wal, Test engineer



Jennie Josefsson, Head of Testing Laboratory

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**Product name:** 4Wheler

**Test laboratory:** Swedish Institute of Assistive Technology  
P.O. Box 510, SE-162 15 Vällingby  
Sorterargatan 23, Vinsta  
Tel: +46 8 620 17 00  
Fax: +46 8 739 21 52

**Test object:** The test conditions of the wheelchair are found in the IDENTIFICATION LIST - Part 1 and Part 2.

**Test object received:** 2008-02-01  
**Test started:** 2008-02-14  
**Test ended:** 2008-03-12

<b>Test method:</b>	Tracking characteristic EN 12183:1999; 7.6 March 1999	
<b>Summary of test:</b>	Maximum deviation	-4 mm
	Pass	
<b>Deviations, additions or exceptions from the test specification:</b>	None	
<b>Test procedure in accordance to ISO EN 12183</b> pagination in accordance to EN 12183	<b>Test conditions and results</b>	
<b>7.6 Tracking characteristic</b> Before fatigue strength (if relevant). Deviation of the wheelchair:	L =	-24 mm
After fatigue strength (if relevant). Deviation of the wheelchair:	L =	-4 mm

Not: Positive deviation is to the right and negative deviation is to the left.

Average speed between measuring points.  
Before fatigue test:

V = 1,08 m/s

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After fatigue test:

V = 1,07 m/s

Distance of free rolling.

Before fatigue test:

L = 11,00 m

After fatigue test:

L = 12,00 m

**Measuring uncertainly according GUM and EA-4/16:**

Average track deviation:

± 10 mm, k=2

Average speed:

± 0,1 m/s, k=2

Distance of free rolling:

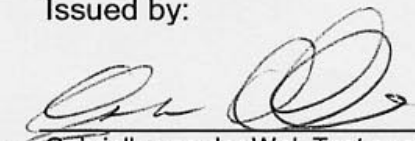
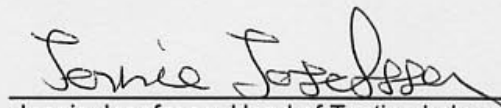
± 0,25 m, k=2

All results concern the tested products only.

This report was issued: 2009-02-09

Issued by:

Approved by:

  
\_\_\_\_\_  
Gabrielle van der Wal, Test engineer  
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Jennie Josefsson, Head of Testing Laboratory

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