



Swedish Institute of  
Assistive Technology, SIAT

Testing Laboratory

Dnr: 10/0027

2010-07-12



1126  
ISO/IEC 17025

**RAPPORT**

utfärdad av ackrediterat laboratorium

REPORT issued by an Accredited Laboratory

Easy Roller

Easy Roller AS

Testing report

Bimanual wheel-driven wheelchairs

ver 2008-01-31



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## MANUAL WHEELCHAIRS Summary of Technical Tests

**Product name:** Easy Roller  
**ISO-code:** 12 22 03

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway



The wheelchair has been tested in accordance with EN 12183:2009 including ISO 7176-1, ISO 7176-3 ISO 7176-8 and EN 12183:1999 7.6.  
It has also been tested in accordance with ISO 7176-5 and ISO 7176-7.

The tested wheelchair had a seat width of 45 cm and was equipped with the following elements (nomenclature as in ISO 6440): foldable leg support, fixed armrest and 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 100 kg test dummy in accordance with ISO 7176-11 with complementary weights up to 150 kg.

### **This report consist of 12 parts and 29 pages.**

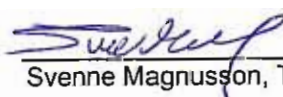
**Test results:** The wheelchair pass all applicable requirements given in the standards enumerated above. All results concern the tested products only.

Swedish Institute of Assistive Technology

2010-07-12

Issued by:

Approved by:

  
Svenne Magnusson, Test performer

  
Jennie Josefsson, Head of Testing Laboratory

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller  
**Test load:** 150 kg

**Serial No:** Serial number 35

**Code according to ISO 9999:** Bimanual wheel-driven wheelchairs  
12 22 03

**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:** 2010-02-24 The test objects have been selected by the client without SIAT's assistance.

**Test started:** 2010-02-24

**Test ended:** 2010-07-12

|   |   |          |                 |
|---|---|----------|-----------------|
| <b>Test method:</b>   | Manually propelled wheelchairs                      |          |                 |
| <b>Summary of test</b>  | <input type="text" value="Pass"/>                   |          |                 |
| <b>Deviations, additions or exceptions from the test specification:</b> | Some test methods not accredited                    |          |                 |
| <b>Test procedure (EN/ISO)</b>  |   |          | <b>Comments</b> |
| ISO 7176-7:1998(E)  | Measurement of seating and wheel dimensions         | part :06 |                 |
| 6. <u>Design requirements</u><br>EN 12183:2009; 7.2, 7.14,<br>B.1.2     | Foot supports, Pushing force and Push handle height | part :07 | Note 1          |

|  |   |          |        |
|--|---|----------|--------|
| ISO 7176-1:1999(E)                                 | Determination of static stability                                     | part :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 12183:2009; 7.5                                 | Fatigue strength of manually operated parking brakes                  | part :10 |        |
| EN 12183:1999; 7.6                                 | Tracking characteristic   | part :11 |        |
| <u>8. Information supplied by the manufacturer</u> |   |          |        |
| ISO 7176-5:1986                                    | Determination of overall dimensions, mass and turning space           | part :14 | Note 1 |

Remarks: No remarks.

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

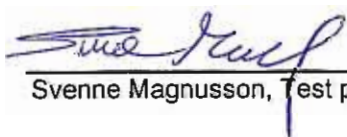
Note 2: Drop test performed with approved result, but the test method is not accredited by SWEDAC.

All results concern the tested products only.

This report was issued: 2010-07-12

Issued by:

Approved by:



Svenne Magnusson, Test performer



Jennie Josefsson, Head of Testing Laboratory

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**Product name:** Easy Roller

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**IDENTIFICATION LIST - Part 1**

**CLIENTS INFORMATION ABOUT THE TEST OBJECT**

|                             |        |                         |       |
|-----------------------------|--------|-------------------------|-------|
| <b>Maximum user weight:</b> | 150 kg |                         |       |
| <b>Seat width:</b>          | 50 cm  | <b>Seat depth:</b>      | 42 cm |
| <b>Seat height:</b>         | 52 cm  | <b>Backrest height:</b> | 52 cm |

| <b>Equipment included in the test object</b> |                     |
|--|---------------------|
| <b>Article number</b>                        | <b>Article name</b> |
|  | Easy Roller         |

**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**

Disk wheel  
Solid  
  
508 mm  
  
Fixed  
Not adjustable



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### Castors <sup>2</sup>

|  |                |
|--|----------------|
| - Wheel type: (I.e. Spoked, Disk wheel)                      | Disk wheel     |
| - Tyre type: (I.e. Solid, Pneumatic)                         | Solid          |
| - Tyre dimensions:   | 150 mm         |
| - Castor fork shaft angle: (I.e. Adjustable, Not adjustable) | Not adjustable |

### Backrest

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

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

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

All results concern the tested products only.

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Approved by:

Jennie Josefsson, Head of Testing Laboratory

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**Product name:** Easy Roller

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

## 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                          | solid          | 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,<br>horizontally | not adjustable | n.a      |
| i)    | Drive wheel position,<br>vertically   | not adjustable | n.a      |
| j)    | Castor assemblies,<br>horizontally    | not adjustable | n.a      |
| k)    | Castor assemblies,<br>vertically      | not adjustable | n.a      |
| l)    | Width between castors                 | not adjustable | n.a      |
| m)    | Castor wheel height                   | not adjustable | n.a      |



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|    |                      |   |     |
|----|----------------------|---|-----|
| 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  |

All results concern the tested products only.

This report was issued: 2010-07-12

Issued by:

Svenne Magnusson, Test performer

Approved by:

Jennie Josefsson, Head of Testing Laboratory

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**Product name:** Easy Roller

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

### 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<br/>Procedures</b> | <b>After the test<br/>Procedures</b> |
|--|---------------------------------------|--------------------------------------|
| <b>Parking brakes</b>                                    | ok                                    | ok                                   |
| <b>Fold ability</b>                                      | n.a                                   | n.a                                  |
| <b>Removal and exchange of<br/>detachable components</b> |                                       |                                      |
| - Armrests   | n.a                                   | n.a                                  |
| - Footrests  | ok                                    | ok                                   |
| - Main wheels  | ok                                    | ok                                   |
| - Castors  | ok                                    | ok                                   |
| - Side support   | ok                                    | ok                                   |
| <b>Adjustability of components</b>                       |                                       |                                      |
| - Footrest   | n.a                                   | n.a                                  |
| - Leg length   | n.a                                   | n.a                                  |

|                       |     |     |
|-----------------------|-----|-----|
| - Backrest            | n.a | n.a |
| - Backrest angle      | n.a | n.a |
| - Armrest height      | n.a | n.a |
| - Main wheel Position | n.a | n.a |
| - Anti tip device     | n.a | n.a |
| - Other               | n.a | n.a |


All results concern the tested products only.

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Jennie Josefsson, Head of Testing Laboratory

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**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller

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

**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:** 2010-02-24

**Test started:** 2010-05-26

**Test ended:** 2010-05-26

**Test method:** Measurement of seating and wheel dimensions  
ISO 7176-7:1998(E)  
1998-05-15

**Test procedure in accordance to ISO 7176-7**  
pagination in accordance to ISO 7176-7

**Test conditions and results**

5. Test equipment

According to HIs method "ISO 7176-7  
Determination of seat and wheel dimensions"

6. Preparation of the wheelchair

According to identification list.

| 7.3 | Measurements                      | Dim.     | Fixed or Min. value | Max. if relevant | Number of increments |
|-----|-----------------------------------|----------|---------------------|------------------|----------------------|
|     | Seat plane angle                  | 1        | 13°                 | n.a              | n.a                  |
|     | Effective seat depth              | 2        | 406 mm              | n.a              | n.a                  |
|     | Seat width                        | Not 1. 3 | 445 mm              | n.a              | n.a                  |
|     | Effective seat width              | Not 2. 4 | 525 mm              | n.a              | n.a                  |
|     | Seat surface height at front edge | 5        | 530 mm              | n.a              | n.a                  |
|     | Backrest angle                    | 6        | 13°                 | n.a              | n.a                  |
|     | Backrest height                   | 7        | 562 mm              | n.a              | n.a                  |
|     | Backrest width                    | Not 3. 8 | 370 mm              | n.a              | n.a                  |
|     | Headrest in front of backrest     | 9        | n.a.                | n.a.             | n.a                  |



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| Measurements                          | Dim.      | Fixed or Min. value | Max. if relevant | Number of increments |
|---------------------------------------|-----------|---------------------|------------------|----------------------|
| Headrest height above seat            | 10        | n.a.                | n.a.             | n.a.                 |
| Footrest to seat                      | 11        | 455 mm              | n.a.             | n.a.                 |
| Footrest clearance                    | 12        | 63 mm               | n.a.             | n.a.                 |
| Footrest length                       | Not 4. 13 | 140 mm              | n.a.             | n.a.                 |
| Footrest-to-leg angle                 | 14        | 89°                 | n.a.             | n.a.                 |
| Leg-to-seat-surface angle             | 15        | 93°                 | n.a.             | n.a.                 |
| Armrest height                        | 16        | 250 mm              | n.a.             | n.a.                 |
| Front-of-armrest to backrest          | 17        | 254 mm              | n.a.             | n.a.                 |
| Armrest length                        | 18        | 235 mm              | n.a.             | n.a.                 |
| Armrest width                         | 19        | 55 mm               | n.a.             | n.a.                 |
| Armrest angle                         | 20        | 10°                 | n.a.             | n.a.                 |
| Distance between armrests             | 21        | 510 mm              | n.a.             | n.a.                 |
| Front location of armrest structure   | 22        | 232 mm              | n.a.             | n.a.                 |
| Hand rim diameter                     | 23        | 428 mm              | n.a.             | n.a.                 |
| Propelling wheel diameter             | 24        | 508 mm              | n.a.             | n.a.                 |
| Horizontal displacement of wheel axle | 25        | 36 mm               | n.a.             | n.a.                 |
| Vertical displacement of wheel axle   | 26        | 199 mm              | n.a.             | n.a.                 |
| Castor wheel diameter                 | 27        | 150 mm              | n.a.             | n.a.                 |

Comments: Not 1. Type of seat: Case other  
 Not 2. Type of armrest panel: 525 mm  
 Not 3. Type of backrest: Case other  
 Not 4. Type of footrest: Case b

EN 12183 6.1.1 Legrest increment adjustments: n.a

Remarks: No remarks

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

Linear measurements: dim 12, 13, 18, 19, 23, 24, 27 ± 1 mm, k=2  
 others ± 11 mm, k=2  
 Angles: ± 1°, k=2


All results concern the tested products only.

This report was issued: 2010-07-12

Issued by:

Approved by:

  
 Svenne Magnusson, Test performer

  
 Jennie Josefsson, Head of Testing Laboratory

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**RAPPORT**

Testing Laboratory

Dnr: 10/0027 :07 2010-07-12

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller

**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:** 2010-02-24

**Test started:** 2010-05-25

**Test ended:** 2010-07-12

**Test method:** Foot supports, Pushing force and Push handle height  
EN 12183:2009; 7.2, 7.14, B.1.2  
September 2009

**Summary of test:**

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

**Test procedure in accordance to EN 12183**  
pagination in accordance to EN 12183

**Test conditions and results**

Test dummie or human test driver  
Test load

Test dummie  
150 kg

**7.2 Foot supports**

7.2.1 Adjustment distance

n.a

7.2.2.2 Foot support gap

n.a

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|  |                         |          |
|--|-------------------------|----------|
| <b>7.14 Pushing force</b>              |                         |          |
| Before fatigue test                    |                         |          |
| 7.14.2                                 | Starting force          | 56 N     |
|  | Constant speed at 1 m/s | 43 N     |
| After fatigue test                     |                         |          |
| 7.14.2                                 | Starting force          | 49 N     |
|  | Constant speed at 1 m/s | 29 N     |
| <b>B.1.2 Operating characteristics</b> |                         |          |
|  | Push handles position   | 1 020 mm |
|  | min                     | n.a      |
|  | max                     | n.a      |

Distance between push handles

min  
max

n.a  
n.a

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: 2010-07-12

Issued by:

Approved by:



Svenne Magnusson, Test performer



Jennie Josefsson, Head of Testing Laboratory

**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller

**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:** 2010-02-24

**Test started:** 2010-05-25

**Test ended:** 2010-05-25

**Test method:** Determination of static stability  
ISO 7176-1:1999(E)  
1999-10-01

**Summary of test:**

|                                    |      |
|------------------------------------|------|
| Minimum slope with anti-tip device | >15° |
| Pass                               |      |

**Deviations, additions or exceptions from the test specification:** Clause 11. Ground clearance of the anti-tip device, minimum 15 mm.

**Test procedure in accordance to ISO 7176-1**  
pagination in accordance to ISO 7176-1

**Test conditions and results**

|  |                      |
|--|----------------------|
| 5. Test equipment                            |                      |
| 5.1 Test plane                               | HIs inv.nr. 002180   |
| 5.3 Means to prevent the wheelchair to roll  | 100 mm high obstacle |
| 5.4 Means to prevent the wheelchair to slide | 100 mm high obstacle |
| 5.6 Means to measure the angle               | HIs inv.nr. 002162   |
| 6. Preparation of the wheelchair             | According ID-LIST    |
| 8. Test dummie or human test driver          | Test dummie          |
| Test load.                                   | 150 kg               |

| Stability Direction   |  |                       | Tipping angle       |     |                    |       |
|---|--|-----------------------|---------------------|-----|--------------------|-------|
|   |  |                       | Least stable        |     | Most Stable        |       |
| 9.  | Forward  | Front wheels locked   | n.a.                |     | n.a.               |       |
|   |  | Front wheels unlocked | >15°                |     | >15°               |       |
| 10.   | Rear   | Rear wheels locked    | 7°                  |     | 7°                 |       |
|   |  | Rear wheels unlocked  | 7°                  |     | 7°                 |       |
| 11.   |  | Antitip devices*      | >15°                |     | >15°               |       |
| 12.   | Sideways   | Left                  | >15°                |     | >15°               |       |
|   |  | Right                 | >15°                |     | >15°               |       |
| * "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:                                    |                       |                     |     |                    | 30 mm |
| 11.3.3  | Set the anti tip device in the most stable configuration     |                       |                     |     |                    |       |
|   | Distance from the ground:                                    |                       |                     |     |                    | 30 mm |

Table 3 - Sideways stability

| Adjustable wheelchair component            | Least stable                |              | Most stable |              |
|--|-----------------------------|--------------|-------------|--------------|
|  | Rear-wheel position, camber | narrow 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:  $\pm 1,3^\circ$ ,  $k=2$

All results concern the tested products only.

This report was issued: 2010-07-12

Issued by:



Svenne Magnusson, Test performer

Approved by:



Jennie Josefsson, Head of Testing Laboratory

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**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller

**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:** 2010-02-24

**Test started:** 2010-05-26

**Test ended:** 2010-07-12

**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

**Test procedure in accordance to ISO 7176-8**  
pagination in accordance to ISO 7176-8

**Test conditions and results**

**Preparation**

Dummy weight:

150 kg

Total weight (incl. dummy):

167 kg

Weight distribution on wheels rear/front:

143 kg / 24 kg



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| <b>Results</b> |   |         |
|----------------|---|---------|
| <b>8</b>       | <b>Static strength</b>  |         |
| 8.4            | Armrest - downward 15° outwards   |         |
|                | Load F1 in N:   | 1 142 N |
|                | Right armrest:  | pass    |
|                | Left armrest:   | pass    |
| 8.5            | Footrests - downward  |         |
|                | Load F2 in N:   | 1 471 N |
|                | Right footrest:   | n.a     |
|                | Left footrest:  | n.a     |
|                | One piece footrest:   | pass    |
| 8.6            | Tipping levers (equivalents) - downward                                     |         |
|                | Load F3 in N:   | 2 210 N |
|                | Right tipping lever:  | n.a     |
|                | Left tipping lever:   | n.a     |
| 8.7            | Handgrips - axial   |         |
|                | Load F4 in N:   | 1 300 N |
|                | Right handgrip:   | n.a     |
|                | Left handgrip:  | n.a     |
| 8.8            | Armrests - upwards 10° outwards   |         |
|                | Load F5 in N:   | 1 270 N |
|                | Right armrest:  | pass    |
|                | Left armrest:   | pass    |
| 8.9            | Footrests - upwards   |         |
|                | Load F6 in N:   | 629 N   |
|                | Right footrest:   | n.a     |
|                | Left footrest:  | n.a     |
|                | One piece footrest:   | n.a     |
| 8.10           | Push handles - upward   |         |
|                | Load F7 in N:   | 1 250 N |
|                | Right push handle:  | n.a     |
|                | Left push handle:   | n.a     |
|                | Bar type handle:  | n.a     |
| <b>9</b>       | <b>Impact strength</b>  |         |
| 9.3            | Backrest  |         |
|                | Angle of swing:   | 30°     |
|                | Centre pivoted backrest   |         |
|                | At the centre of the backrest:  | n.a     |
|                | At a point 0,4 x the backrest with from<br>the centre line of the backrest: | n.a     |

|      |  |  |
|------|--|--|
|      | Other type of backrest<br>At the centre of the backrest 30 mm<br>from the top:   | pass   |
|      | Backrest with mounted on two supporting members<br><br>At the right supporting member 30 mm<br>from the top of the backrest:<br>At the left supporting member 30 mm<br>from the top of the backrest: | n.a<br><br>n.a   |
| 9.4  | Hand rim<br>Angle of swing:<br>With the pendulum impact in line with<br>the attachment point:<br>With the pendulum impact between two<br>attachment points:  | 45°<br><br>pass<br><br>n.a   |
| 9.5  | Castors<br>Angle of swing:<br>Right castor:<br>Left castor:  | 56°<br>pass<br>pass  |
| 9.6  | Footrests<br>Angle of swing:<br>Lateral right:<br>Lateral left:<br>Longitude right:<br>Longitude left:   | 56°<br>pass<br>pass<br>pass<br>pass  |
| 10.4 | <b>Two-drum test</b><br><b>Preparation</b><br>Attachments of the wheelchair on the Double Drum:<br><br>Method for tightening the dummy:  | <br><br>Pull rods attached between the frame in the<br>nearness of the main wheel position and the<br>machine. Straps between the front and rear part<br>of the wheelchair to prevent sideways movement.<br><br>Straps between the fulcrum of the dummy and the<br>W/C frame. Straps between the dummy and the<br>frame as well as between the dummy and the<br>backrest to prevent sideways movement. A link on<br>each side of the dummy between the seat trunk<br>and the backrest trunk. The links permits the<br>backrest section to move $\pm 2^\circ$ . The footrest<br>weights are fixed to the footrest with bolts. |
|      | <b>Results</b><br>Total number of cycles 200 000:  | pass   |

|   |  |
|---|--|
| <b>10.5 Drop test<br/>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 6666:                    | pass   |
| <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: 2010-07-12

Issued by:

Approved by:

  
Svenne Magnusson, Test performer

  
Jennie Josefsson, Head of Testing Laboratory

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**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller

**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:** 2010-02-24

**Test started:** 2010-05-25

**Test ended:** 2010-07-12

**Test method:** Determination of the effectiveness of brakes  
ISO 7176-3:2003  
2003-04-15

**Summary of test:**

|               |    |
|---------------|----|
| Minimum slope | 9° |
| Pass          |    |

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

**Test method:** Fatigue strength of manually operated parking brakes  
EN 12183:2009; 7.5

**Summary of test:**

|      |
|------|
| Pass |
|------|

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

| Test procedure in accordance to ISO 7176-3<br>pagination in accordance to ISO 7176-3   | Test conditions and results   |
|--|---|
| <p>5 Test equipment</p> <p>5.2 Adjustable test plane</p> <p>5.4 Test dummie or human test driver</p> <p>5.5 Weights (if human test driver)</p> <p>5.7 Inclinometer</p> <p>5.8 Force measurement equipment<br/>Test load.</p> <p>6 Preparation of the wheelchair</p> <p>6.1 Set-up procedures:</p> <p>6.2 Adjustable brakes according to table 1:</p> <p>7 Brake performance</p> <p>7.2 Parking brakes</p> <p><u>Before fatigue test</u></p> <p>Operation force      Right side:<br/>   Left side:</p> <p>Test result facing downhill:<br/>Test result facing downhill:<br/>Test result facing downhill:<br/>Test result facing uphill:<br/>Test result facing uphill:<br/>Test result facing uphill:</p> <p><u>After fatigue test</u></p> <p>Operation force      Right side:<br/>   Left side:</p> <p>Test result facing downhill:<br/>Test result facing downhill:<br/>Test result facing downhill:<br/>Test result facing uphill:<br/>Test result facing uphill:<br/>Test result facing uphill:</p> | <p>HIs inv.nr 002180</p> <p>Test dummie</p> <p>n.a.</p> <p>HIs inv.nr 002162</p> <p>HIs inv.nr 002294</p> <p>150 kg</p> <p>According to ID-list</p> <p>ok</p> <p>33 N</p> <p>30 N</p> <p>9°      roll</p> <p>n.a      slide</p> <p>n.a      tip</p> <p>n.a      roll</p> <p>n.a      slide</p> <p>7°      tip</p> <p>48 N</p> <p>45 N</p> <p>9°      roll</p> <p>n.a      slide</p> <p>n.a      tip</p> <p>&gt;10°      roll</p> <p>&gt;10°      slide</p> <p>4°      tip</p> |

Remarks:      No remarks

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

The angle when brake failure (turning of wheels), loss of friction (skidding) or instability (tipping):       $\pm 2^\circ$ ,  $k=2$

(If the angle is smaller than  $5^\circ$  accounts  $<5^\circ$ , if the angle is greater than  $20^\circ$  accounts  $>20^\circ$ )

Force required for pressing the brake handle:       $\pm 3$  N,  $k=2$

| Test procedure in accordance to EN 12183<br>pagination in accordance to EN 12183                  | Test conditions and results |
|---|-----------------------------|
| Test equipment<br>Equipment for parking brake fatigue strength<br>Frequency not exceeding 0,5 Hz. | HIs inv.nr 002188           |
| <b>7.5 Test method for parking brake fatigue strength</b>   |                             |
| Tested brake  | left                        |
| <b>Results</b> Total number of cycles:      60 000  | pass                        |

Remarks:      No remarks

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


All results concern the tested products only.

This report was issued: 2010-07-12

Issued by:

Approved by:

  
Svenne Magnusson, Test performer

  
Jennie Josefsson, Head of Testing Laboratory

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**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Easy Roller

**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:** 2010-02-24

**Test started:** 2010-05-25

**Test ended:** 2010-07-12

|  |   |        |
|--|---|--------|
| <b>Test method:</b>  | Tracking characteristic<br>EN 12183:1999; 7.6<br>March 1999 |        |
| <b>Summary of test:</b>  | Maximum deviation   | 73 mm  |
|  | Pass  |        |
| <b>Deviations, additions or exceptions from the test specification:</b>                                      | None  |        |
| <b>Test procedure in accordance to ISO EN 12183</b><br>pagination in accordance to EN 12183                  | <b>Test conditions and results</b>                          |        |
| <b>7.6 Tracking characteristic</b><br>Before fatigue strength (if relevant).<br>Deviation of the wheelchair: | L =   | -73 mm |
| After fatigue strength (if relevant).<br>Deviation of the wheelchair:  | L =   | 66 mm  |

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



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Average speed between measuring points.

Before fatigue test:

V = 0,58 m/s

After fatigue test:

V = 0,97 m/s

Distance of free rolling.

Before fatigue test:

L = 4,21 m

After fatigue test:

L = 5,41 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

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Jennie Josefsson, Head of Testing Laboratory

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Testing report

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**Client:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Manufacturer:** Easy Roller AS  
Sørlandsveien 50  
8640 Hemnesberget  
Norway

**Product name:** Etac M100

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

**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:** 2010-02-24

**Test started:** 2010-05-25

**Test ended:** 2010-05-26

**Test method:** Determination of dimensions, mass and manoeuvring space  
ISO 7176-5:2008E  
2008-06-01

**Summary of test:**

**Test procedure in accordance to ISO 7176-5**  
pagination in accordance to ISO 7176-5

**Test conditions and results**

4. Wheelchair classes and occupant groups

4.2 Classes of electrically powered wheelchairs

n.a

4.3 Occupat mass groups

see table 1

7. Preparation of the test wheelchair  
Effective seat width

520 mm



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|      |  |                       |
|------|--|-----------------------|
| 7.6  | Loading of the wheelchair<br>Test load<br>Test dummie or human test driver | see table 1<br>150 kg |
| 8.   | Required measurements  |                       |
| 8.1  | General  |                       |
| 8.2  | Full overall length  | 890 mm                |
| 8.3  | Overall width  | 670 mm                |
| 8.4  | Handgrip height  | 1020 mm               |
| 8.5  | Stowage length   | n.a                   |
| 8.6  | Stowage width  | 670 mm                |
| 8.7  | Stowage height   | n.a                   |
| 8.8  | Rising   | 50 mm                 |
| 8.9  | Total mass   | 18,0 kg               |
| 8.10 | Mass of heaviest part  | n.a                   |
| 8.11 | Pivot with   | n.a                   |
| 8.12 | Reversing width  | n.a                   |
| 8.13 | Turning diameter   | n.a                   |
| 8.14 | Ground clearance   | n.a                   |
| 8.15 | Required width of angled corridor  | 800 mm                |
| 8.16 | Required doorway entry depth   | 1100 mm               |
| 8.17 | Required corridor width for side opening                                   | 860 mm                |

Table 1 — Reference set-up values for wheelchairs with handrims

| Item<br><br>Differing terms used in ISO 7176-7 and ISO 7176-22 are given in [brackets]. | Reference set-up values  |                       |                  | Configuration of the wheelchair |
|---|--|-----------------------|------------------|---------------------------------|
|   | Occupant mass group  |                       |                  |                                 |
|   | I<br>(<50 kg)  | II<br>(50-<br>125 kg) | III<br>(>125 kg) |                                 |
| 7.6.2 Mass of the test dummie (depending on occupant mass group)                        | 50   | 75                    | 100              | 150 kg                          |
| Seat plane angle (degrees)  | 4  | 4                     | 4                | n.a                             |
| Effective seat depth (mm)   | 340  | 450                   | 450              | n.a                             |
| Effective seat width <sup>a</sup> (mm)  | 320  | 450                   | 500              | n.a                             |
| Seat surface height at front edge (mm)  | 470  | 520                   | 520              | n.a                             |
| Back support angle [backrest angle] (degrees)   | 10   | 10                    | 10               | n.a                             |
| Back support height [backrest height] (mm)  | 340  | 420                   | 420              | n.a                             |
| Handgrip height (mm)  | 820  | 950                   | 950              | n.a                             |
| Back support width [backrest width] (mm)  | 320  | 450                   | 500              | n.a                             |
| Footrest to seat (mm) BUT NO LESS THAN: Footrest clearance (mm)                         | 340  | 450                   | 450              | n.a                             |
| BUT NO LESS THAN: Footrest clearance (mm)   | 50   | 40                    | 40               | n.a                             |
| Footrest length (mm)  | 150  | 150                   | 150              | n.a                             |
| Footrest to leg angle (degrees)   | 90   | 90                    | 90               | n.a                             |
| Leg to seat surface angle (degrees)   | 90   | 97                    | 97               | n.a                             |
| Armrest height (mm)   | 160  | 200                   | 200              | n.a                             |
| Front of armrest to back support [front of armrest to backrest] (mm)                    | 200  | 320                   | 320              | n.a                             |
| Handrim diameter (millimetres)  | 490  | 530                   | 530              | n.a                             |
| Manoeuvring wheel diameter [propelling wheel diameter] (millimetres)                    | 560  | 610                   | 610              | n.a                             |
| Wheelbase (millimetres)   | 340  | 400                   | 400              | n.a                             |
| Camber (degrees)  | -3   | 0                     | 0                | n.a                             |
| Horizontal location of wheel axle (millimetres)   | 20   | 20                    | 20               | n.a                             |
| Vertical location of wheel axle (millimetres)   | 166  | 184                   | 184              | n.a                             |
| Castor wheel diameter (millimetres)   | 150  | 175                   | 175              | n.a                             |
| Castor trail (millimetres)  | 35   | 50                    | 50               | n.a                             |
| Track of drive wheel or manoeuvring wheels [drive wheel track width]                    | mid-position   |                       |                  | n.a                             |
| Track of castor wheels or pivot wheels [castor wheel track width]                       | mid-position   |                       |                  | n.a                             |
| Movable wheel, horizontal position [castor stem housing position, horizontal]           | mid-position   |                       |                  | n.a                             |
| Movable wheel, vertical position [castor stem housing position, vertical]               | mid-position   |                       |                  | n.a                             |
| Movable wheel, vertical axle position [castor wheel axle position, vertical]            | mid-position   |                       |                  | n.a                             |
| Castor rake [castor stem angle, fore-aft plane] (degrees)                               | vertical +1 / -0   |                       |                  | n.a                             |
| Castor cant [castor stem angle, lateral plane] (degrees)                                | vertical ±0,5  |                       |                  | n.a                             |
| a   | Since the nominal seat width (as measured in ISO 7176-7 as "seat width") is measured in various ways the results are not comparable. Therefore, the effective seat width is used as the reference value since this dimension both provides reliable comparison between the values and meets the occupant's real needs. |                       |                  |                                 |
| b   | These adjustments are used only when they do not conflict with any seating adjustments.  |                       |                  |                                 |



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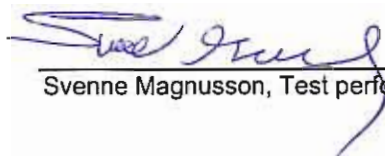
Remarks: No remarks

All results concern the tested products only.

This report was issued 2010-07-12

Issued by:

Approved by:



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Svenne Magnusson, Test performer



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Jennie Josefsson, Head of Testing Laboratory