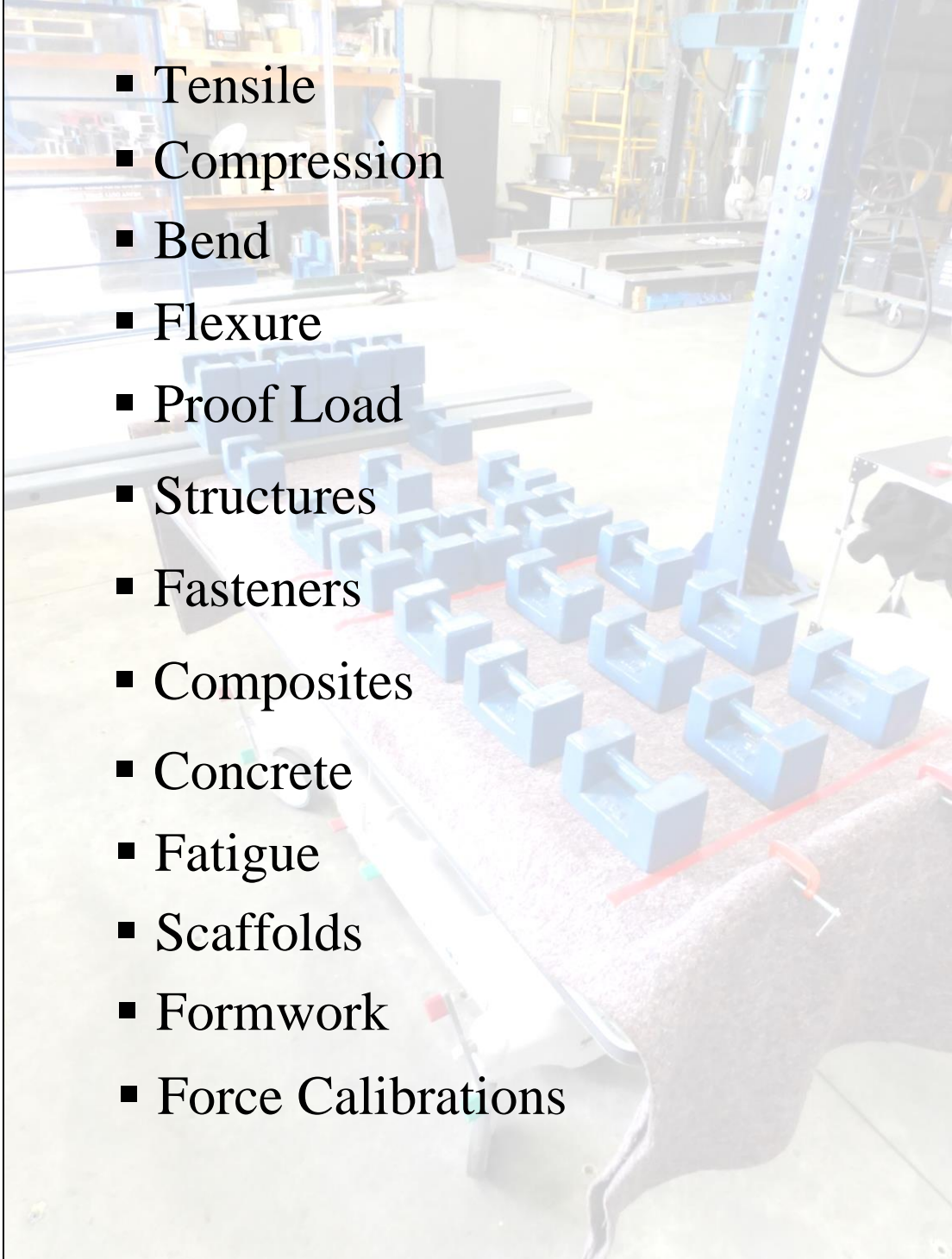


# Mechanical Testing

- 
- Tensile
  - Compression
  - Bend
  - Flexure
  - Proof Load
  - Structures
  - Fasteners
  - Composites
  - Concrete
  - Fatigue
  - Scaffolds
  - Formwork
  - Force Calibrations

IN CONFIDENCE TO THE CLIENT

REPORT NO: MT-15/509

## LOAD TESTING OF A FURNITURE DEVELOPMENTS 'PATIENT TRANSFER STRETCHER'

CLIENT: FURNITURE DEVELOPMENTS AUSTRALIA  
ATTENTION: PETER FURLONG  
71-73 ROBERTS AVENUE  
MULGRAVE VIC 3170

DATE OF TESTING: JULY 24<sup>TH</sup> & JULY 27<sup>TH</sup> 2015

DATE OF REPORT: JULY 29<sup>TH</sup> 2015

### TEST SYNOPSIS:

A power-operated patient transfer stretcher, designed for general medical and domestic applications, was delivered to the MTS laboratory for load testing (see Fig.1).

As instructed by the client, the stretcher was to be load tested to determine if the device could withstand static loads commensurate with the manufacturers stated Safe Working Load (SWL) and factored SWL static loads as per IEC 60601-2-52-2009 PARTICULAR REQUIREMENTS FOR THE BASIC SAFETY AND ESSENTIAL PERFORMANCE OF MEDICAL BEDS and AS/NZS 3200 Part 2.38-2007 ELECTRICALLY AND MANUALLY OPERATED MEDICAL BEDS FOR ADULT USE.

The scope of work was strictly to verify the load capacity of the stretcher and does not include testing of the stretcher's individual components. Reports for testing of individual components have been provided by the client and are provided in Appendix A.

### TEST ITEM:

Upon arrival at the MTS laboratory the following details were recorded for the test item:

- 1) *Nominated SWL:* 200kg
- 2) *Product Name:* KAIFAT
- 3) *Product Model:* SE (A)
- 4) *Stretcher Dimensions:* 2000mm (Length); 800mm (Width)
- 5) *The test item was equipped with hand-held remote controlled electric actuators (LINAK<sup>®</sup> components) for raising and lowering of the stretcher's platform.*
- 6) *Four castor wheels were fitted, each with a brake locking device. Nominal wheel dimensions - 200mm outer diameter, width 35mm.*



**FIG.1**  
**PATIENT TRANSFER STRETCHER**

**TEST PROCEDURES:**

***Safe Working Load (SWL) Test***

Testing was conducted with the stretcher raised to its highest position. As per Figure 102 of AS/NZS 3200.2.38 – 2007, the test load was then applied in a manner as to simulate the weight distribution of a person lying on the stretcher (see Fig.2). A static load of **2000 Newtons** ( $\approx$ **200kg**), equal to the nominated SWL, was applied to the stretcher’s platform and held for fifteen (15) minutes. In the absence of information about the orientation of a patient on the stretcher, testing was conducted in both directions of the stretcher head and foot positions.



**FIG.2  
VERTICAL LOADING TEST  
SWL OF 200KG**

***Factored SWL – IEC 60601-2-52***

Upon completion of the SWL test, a test load of **4000 Newtons** ( $\approx$ **400kg**), commensurate with the requirements of IEC 60601-2-52 Clause 201.9.8.3.2, was laid on the stretcher (see Fig.3).



**FIG.3  
VERTICAL LOADING TEST  
400KG**

***Lateral Stability – AS/NZS 3200***

As specified in AS/NZS 3200 Clause 24.3 – Lateral Stability, the test item was then loaded to a SWL of **200kg** and a vertical longitudinal downward force of **2250 Newtons** ( $\approx$ **225kg**) was evenly distributed along the edge of the bed’s platform (see Fig. 4). The test item was inspected for stability and functionality checks subsequent to the test force being removed.

***Longitudinal Stability – AS/NZS 3200***

Testing was also conducted for longitudinal stability whereby the test item was loaded to its SWL of **200kg** and an additional load of **1500 Newtons** ( $\approx$ **150kg**) was then applied to one end of the stretcher.

**TEST OBSERVATIONS:**

***Safe Working Load (SWL) Test***

In each case, the patient stretcher supported the SWL load without indication of failure. Upon removal of the test load, post-test examination of the item did not reveal any evidence of structural damage or residual deformation.

***Factored SWL – IEC 60601-2-52***

After a load of **4000 Newtons** was applied and released, visual inspection of the stretcher did not reveal any evidence of structural damage and the stretcher was deemed serviceable by raising and lowering the platform.

***Lateral and Longitudinal Stability – AS/NZS 3200***

For both tests, the stretcher did not overturn after the application of load.



**FIG.4  
LATERAL STABILITY TEST**

**TEST COMMENTS:**

The KAIFAT patient stretcher, as reported and tested herein, has successfully supported a distributed Safe Working Load of 200kg without any visual evidence of structural damage. Further, the test item did not overturn when a load of 2250 Newtons was applied along one edge of the stretcher platform and; the stretcher did not tip or overturn when a load 1500 Newtons was applied to one end of the stretcher platform.

Notes:

1. Melbourne Testing Services (MTS) Pty Ltd shall not be liable for loss, cost, damages or expenses incurred by the client or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Melbourne Testing Services Pty Ltd be liable for consequential damages including, but not limited to, lost profit, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested.
2. It remains the responsibility of the client to ensure that the samples tested are representative of the entire product batch.
3. MTS shall take no responsibility for the procurement and authenticity of the test product as described herein.
4. This report is specific to the test items in their state at the time of testing. It should not be taken as a statement that all products in all states of repair, would also perform in the same manner. The report is strictly limited to the performance of the patient mover for the tests described herein.
5. MTS shall take no responsibility for the interpretation or misinterpretation of the procedures or calculation methods as provided herein or for the appropriateness or validity of the test procedures for the test items described and reported herein.
6. MTS shall take no responsibility for the installation procedures used for the test items as described herein.
7. This report is specific to the vertical load capacity of the stretcher for static load verification only. The reader should be aware the report does not cover the overall performance of the patient stretcher. Specifically, the durability performance of the device in terms of AS and International standards and the capacity of components such as vertical actuators, forward and reverse motor have not been addressed in the report.
8. The tests as reported herein are considered Experimental Type Tests and therefore do not validate or certify the products with any Australian or International standards that may apply.
9. This report does not cover the stretcher performance to extended or retract a 200kg, and instability which may occur under inappropriate usage.
10. This report does not cover Linen caught in mechanisms
11. This report only covers the static load capacity of the stretcher and does not cover stability performance during transport.





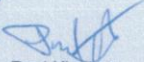
DR. SIVA NAIDOO  
SENIOR PROJECT ENGINEER

The tests reported herein have been performed in accordance with approved MTS procedures.  
This document shall not be reproduced except in full.




Gavin van Deventer  
TEST ENGINEER

**APPENDIX A:**

		Ref. Certif. No. <b>SE-69438</b>
IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME		SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC
<b>CB TEST CERTIFICATE</b>		<b>CERTIFICAT D'ESSAI OC</b>
Product Produit	Lifting column	
Name and address of the applicant Nom et adresse du demandeur	LINAK A/S, Smedevænget 8, Guderup, DK-6430 Nordborg, DENMARK	
Name and address of the manufacturer Nom et adresse du fabricant	Same as applicant	
Name and address of the factory Nom et adresse de l'usine <small>Note: When more than one factory, please report on page 2                  Note: Lorsque il y plus d'une usine, veuillez utiliser la 2<sup>ème</sup> page</small>	Same as applicant	
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Cycle: 10%, Max. 2 min./18 min. IPX6	
Trademark (if any) Marque de fabrique (si elle existe)	LINAK	
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur		
Model / Type Ref. Ref. De type	BL1*****	
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2 <sup>ème</sup> page)	See page 2 and 3	
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60601-1:2005	
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	1110856-1	
This CB Test Certificate is issued by the National Certification Body Ce Certificat d'essai OC est établi par l'Organisme National de Certification		
Intertek Semko AB Box 1103 SE-164 22 Kista, Sweden Int +46 8 750 00 00 Date: 21 June 2012	 Signature:  Paul Klemets	
Mandated reviewer: PEL	1/3	ASW/ASG

TKB



	Ref. Certif. No.
	<b>SE-69438</b>

**Additional information**

The BL1 lifting column is developed for use together with LINAK control boxes.

**Conditions of acceptability:**

- Leakage current tests must be performed in the end use product
- The BL1 must be supplied by a power supply or transformer by a minimum complies with the requirements of IEC 60601-1
- The distances pole to pole in the BL1 does not comply with the requirements of the standard and it must be evaluated in the end use product if a hazardous situation could occur in case of a short circuit
- Marking on the lifting column and it's information must be in the accompanying documents of the end use product
- Cleaning and disinfection of the complete end use product must be evaluated in the end use product
- Suspended masses according to Clause 9.8 must be evaluated in end use product
- Mechanical wear according to cl. 15.2 shall be evaluated in the end use product


**Additional information and requirements not evaluated by Intertek Semko AB:**

- The BL1 has been evaluated for MOPP
- The BL1 has been evaluated up to 40°C ambient temperature
- The maximum input voltage for the BL1 is 24VDC
- Packaging
- EMC according to IEC 60601-1-2
- Usability according to IEC 60601-1-6

**The product is also in conformity with the following standards:**

- ES ANSJ\_AAMI ES60601-1 as shown in test report No. 1110856-2
- CAN\_CSA C22\_2 No.60601-1 as shown in test report No. 1110856-3

Date: 21 June 2012


Signature: 

TB

Mandated reviewer: PEL


2/3

ASW/ASG

	Ref. Certif. No. <b>SE-69438</b>
-----------------------------------------------------------------------------------	-------------------------------------

**BL1\*\*\*\*\* in type reference have the following meanings:**

BL1 4 1 H A 0 1 400 A	
Build in dimension:	A = 350 mm
Stroke:	200 mm, 300 mm, 400 mm
Motor:	1 = Standard 24V DC 2 = 12V DC
Safety option:	0 = Standard 1 = Safety nut, push
Colour:	A = Anodized aluminium B = Anodized aluminium and painted top and bottom plate (RAL7035) C = Anodized aluminium and ei-zinc plated top- and bottom plate
Positioning:	1 = Endstop H = Endstop and dual hall
IP degree:	1 = IPX6
Spindle:	4 = 4mm pitch 9 = 9mm pitch (12V DC only)
Actuator type:	BL1

Date: 21 June 2012      Signature: 

TB

Mandated reviewer: PEL

3/3

ASW/ASG





NINGBO KAIFAT MEDICAL SCIENCE & TECHNICAL CO., LTD.

**JAD Motor Test REPORT**

<b>Customer</b>	ZNQ	<b>Voltage</b>	24V
<b>File Name</b>	169	<b>Power Rated</b>	200W
<b>Motor No.</b>	1506032408001	<b>Speed Rated</b>	50rpm
<b>Tester</b>	2	<b>Test Date</b>	March 27th 2015

No	U (V)	I (A)	P1 (W)	T (N.m)	n (rpm)	Po (W)	EFF (%)	P.F
1	24.1	0.266	6.4	0.07	82	0.60	9.37	0.00
2	24.1	0.307	7.4	0.03	81	0.25	3.44	0.00
3	24.1	0.437	10.5	0.43	80	3.60	34.19	0.00
4	24.1	0.746	18.0	2.38	79	11.42	63.39	0.00
5	24.1	1.187	28.6	2.53	77	20.40	71.21	0.00
6	24.1	1.663	40.1	4.18	74	32.39	80.70	0.00
7	24.1	2.282	55.1	6.16	72	46.44	84.34	0.00
8	24.1	3.029	73.1	8.13	68	57.89	79.20	0.00
9	24.1	3.809	91.9	10.57	66	73.05	79.45	0.00
10	24.2	4.707	113.7	13.10	62	85.05	74.81	0.00
11	24.1	5.576	134.6	15.87	59	98.05	72.86	0.00
12	24.1	6.482	156.4	18.43	54	104.2	66.62	0.00
13	24.1	7.480	179.1	21.13	51	112.8	63.01	0.00
14	24.1	8.613	208.0	24.19	47	119.1	57.24	0.00
15	24.2	9.686	234.0	27.06	43	121.8	52.06	0.00
16	24.1	10.709	258.5	30.45	40	127.5	49.34	0.00
17	24.1	11.838	285.8	34.17	34	121.7	42.56	0.00
18	24.1	12.841	309.9	35.98	27	101.7	32.83	0.00

*Yu. Qiu. Jin*





NINGBO KAIFAT MEDICAL SCIENCE & TECHNICAL CO., LTD.

## Kevlar Black Fabric Test REPORT

### Sewing Test

**Test Materials:**

Liu Qing brand of high-strength thread sewing 150D \* 3 and medical disinfectant (35-41g / L)

**Test Description:**

Sewing thread after 30 days of immersion, no fading phenomenon, a slight change in strength: Before: 24N, After: 20N;

The sewing meets the requirements of Kevlar black fabric.

### Glue Test

**Test Material:**

3M glue, water-proof transfer cloth and medical disinfectant (35-41g / L)

**Test Description:**

Glued the transfer cloth with 3M glue, after the glue is natural dry; then wash the adhesive layer with hydrogen peroxide three times every day; After 30 days of that, no bubbles and unglued phenomenon; meeting the medical requirements of the Kevlar black fabric cloth.


### Test Result:

The Kevlar black fabric meets the requirement of medical transfer cloth.

*Yu. Qik. Jin*



2015-7-3

	<b>NINGBO KAIFAT MEDICAL SCIENCE AND TECHNICAL CO, Ltd</b> <b>Model 85DX Rolling Handle Test Report</b>	Approve	Inspector	Tester
		Qun Ji	Xuan Wang	Hongfen Wu

▼Test Essentials:

Sample Name:	Electric Rolling Handle	Test No. :	5pcs	Test Applicant:	Qun Ji
Model No. :	85DX	Test Content:	Electricity Function, Mechanical Property, Service Life		
Test Company:	Five Stars Manufacturing	Test Purpose:	Check and confirm the quality and function of 85DX handle good		
Sample Description:	Linear Hall component, Spring Rebound, Switch, Battery Level Indicating	Test For	Ningbo Kaifat Medical Science and Technical Co, Ltd		

▼Test Project & Result:

No.	Test Content	Test Technology	Test Standard	Test Result	Remark
1	Function Test	Hall output voltage, Spring Performance, Battery Level Indicating	According to the requirements of Drawing	GOOD	
2	High Temperature Test	Put the sample to be tested into a temperature test chamber, the parameters are set at 60 °C ± 2 °C temperature continuous placement 2H, until the end of the trial	No deformation of Parts, normal performance	GOOD	
3	Low Temperature Test	Put the sample to be tested into a temperature test chamber, the parameters are set at -20 °C ± 2 °C temperature continuous placement 2H, until the end of the trial	No deformation of Parts, normal performance	GOOD	
4	Vibration Test	The samples were fixed to the vibration test stand, good direction flag, good vibration test setup parameters, start vibration tester 2 hours	All parts safe and sound, no falling pieces, normal performance	GOOD	
5	Rebound Fatigue Test	Fix the rolling handle on fatigue testing machine, turn on the rated working voltage, frequency of 60 beats / min rotation repeatedly turning, the test can be coated with a lubricant on moving parts, test 50,000 times continuous action	Performance is normal, without any crack plastic parts	GOOD	
6	Switch Fatigue Test	The operating speed for 15 to 30 times / min, the switch ON / OFF operation of back and forth 50,000 times	Performance is normal, without any crack plastic parts	GOOD	
7	Salt Spray Test	NaCl concentration of 50 ± 5g / l, pH6.5 ~ 7.2, continuous spray 8 hours, and then left for 24 hours. Salt the inside temperature at 35 ± 2 °C, when placed inside temperature 20 ~ 25 °C	No red rust	GOOD	
8	Free-fall Test	Free fall from a height of 1m (wood floor) Direction: X, Y, Z 3 each direction, no requirements of direction after falling	Performance is normal, without any crack plastic parts	GOOD	
9	Terminal Plug-in Tensile Test	Using the pull-out force tester and homemade jig 30N applied to the harness tension for a minute	Harness is not detached from the terminal	GOOD	
10	Wire Tension Test	Using the pull-out force tester and homemade jig, 130N tension is applied to the harness, holding one minute	Harness is not detached from the brake	GOOD	
<b>Test Result:</b>		<b>GOOD</b>	<input checked="" type="checkbox"/>	<b>Pending</b>	<input type="checkbox"/>

# Test Report No.: 11106 E



Date/sign: 7.5.2010 QW/Ja Copies to:  
 Article: 2044/46UAX/XSX200R36-32 /R2t VC, QW  
with steel guide stem  
 Company TRG  
 Code/Drawing no.: \_\_\_\_\_  
 Test for: VC

Test-set up according to EN 12531 conditions. and/or DIN/TRG

**1. Dynamic test**

Loading:	<b>1,500</b>	N	Distance	
Speed	<b>1.1</b>	m/s	with obstacles:	without obstacles: m
Height of obstacles	<b>5.0</b>	mm	Wheel-rotation:	<b>30,000</b>
Quantity of obstacles	<b>1,000</b>		Test-apparatus:	<b>B2</b>
			Running-time:	<b>3</b> Pause: <b>1</b> min

**2. Static test**

Load	<b>4,500</b>	N	Wheel Ø before test:	<b>199.6</b> mm
Load period	<b>1</b>	h	Wheel Ø after 1 hour:	<b>199.3</b> mm
Floortype	<b>steel</b>		Flattening:	<b>0.3</b> mm
Temperature	<b>20</b>	°C	Hardness/Shore:	<b>40 D</b>

**3. Operation test of the locking device**

Number of actuation: **30,000**

<b>4. Rolling resistances at:</b>	<b>500</b>	N	<b>1,100</b>	<b>1,500 N</b>	<b>load</b>
rolling resistance	<b>5</b>	N	<b>11</b>	<b>15</b>	N
swivel resistance	<b>35</b>	N	<b>60</b>	<b>74</b>	N

**5. Special conditions**

- 5.1 wheel lock with a action force of 6 Nm
- 5.2 swivel lock with 6 Nm action force min. 40% of the load in total- und direction lock

**6 Test-description**

- 6.1 dyn test acc. EN 12531 without complaint
- 6.2 wheel lock 1100 and 1500 N load = > 40 %
- 6.3 swivel lock 1100 and 1500 N load = > 40 %
- 6.4 operation test 30000 action without complaint

**7 Test-results**

The caster 2044/46UAX/XSX200R36-32/R26-28 has pass the test acc EN 12531 for 1500 N load and the requirement acc. TRG

QW/Ja 01/10



## DECLARATION OF CONFORMITY

LINAK A/S  
Smedevænget 8  
DK - 6430 Nordborg

hereby declares that LINAK Actuator System composed of:

Lifting Column            BL1, 12 V DC and 24 V DC operation

complies with the EMC Directive: 2004/108/EC according to following standards:  
EN 55011:2009 Class B  
ISO 7176-21:2009, EN 12184:2009  
EN 60601-1-2:2007, clause 6.2, EN 60601-2-38/A1:2000 clause 6.2, and EN1970/A1:2005, clause 5.12.2

and complies with Low Voltage Directive 2006/95/EC according to the standard:  
Not Applicable.

Additional information:  
The system does also comply with the standards:  
EN 60601-1-2:2007, Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests  
EN 12184:2009, Electrically powered wheelchairs, scooters and their chargers - Requirements and test methods  
ISO 7176-21:2009, Wheelchairs - Part 21: Requirements and test methods for electromagnetic compatibility of electrically powered wheelchairs and scooters, and battery chargers

Nordborg, 2011-07-11

LINAK A/S  
John Kling, B.Sc.E.E.  
Certification and Regulatory Affairs  
Authorized to compile the relevant technical documentation

Original Declaration