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## Testing of Campus Air chair

(1 appendix)

### 1 Introduction

By commission of Lammhults Möbel AB, a Campus Air chair has been tested by SP in accordance with Möbelfakta requirement specification 4.2.1 Seating furniture for public locations, issue 0202 and SS-EN 15373 Furniture – Strength, durability and safety – Requirements for non-domestic seating, level 2.

### 2 Test specimen

Picture 1 Campus Air



Frame: Steel tube Ø16 mm  
Seat / backrest: Moulded polyamide (PA6) reinforced with glass fibre

The test specimen was selected by the customer and arrived at SP on March 31, 2008.

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### 3 Test methods and test procedure

Before testing the test specimen was not conditioned for one week in a climate of  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  relative humidity, in accordance with the standards. Testing was carried out in this climate.

The test methods are explained in Appendix 1 in accordance with Möbelfakta requirement 4.2.1 Seating furniture for public locations, issue 0202 and SS-EN 15373 Furniture – Strength, durability and safety – Requirements for non-domestic seating, level 2.

The tests were carried over the period April 2 - 9, 2008.

### 4 Results

The result is reported in Appendix 1.

At the end of the test, the tested piece did not exhibit any faults, fractures or other damage judged to affect its safety when used in accordance with SS-ENV 12520. The requirement has been met.

At the end of the test, the tested piece did not exhibit any damage or deformation which is expected to affect its function or appearance.

The test results apply solely to the specimen tested.

**SP Technical Research Institute of Sweden**  
**Wood Technology**



Charlotte Bengtsson  
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### Appendix

Test report (5 pages)

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## Appendix 1

### 4.2. Contract use

#### 4.2.1 Seating

	Test	References: Requirements
<b>1. General requirements</b>		
1.1 <u>Components or parts accessible during normal use shall have no burrs, sharp edges or sharp points.</u>	√	SS-ENV 12520. Clause 4.1
1.2 <u>There shall be no open-ended tubes.</u>	√	SS-ENV 12520. Clause 4.1
1.3 <u>Shear and squeeze points.</u> The distance between moving parts accessible during normal use shall be kept to ≤ 8 mm or ≥ 25 mm in any position during movement.		SS-ENV 12520. Clause 4.2
1.3.1 <u>Shear and squeeze points when setting up and folding.</u> The requirements in 1.3 are not applicable when shear and squeeze points are created only when setting up and folding.		SS-ENV 12520. Clause 4.2.1
1.3.2 <u>Shear and squeeze points under the influence of powered mechanisms.</u> The requirements in 1.3 are applicable to all moving parts created by parts operated by powered mechanisms, including springs.		SS-ENV 12520. Clause 4.2.2
1.3.3 <u>Shear and squeeze points under body weight</u> Shear and squeeze points as defined in 1.3 are not acceptable if unintentional movement of the parts may occur so that a hazard is created by the weight of the user.		SS-ENV 12520. Clause 4.2.3
1.4 <u>All lubricated parts shall, when in normal use, be designed to protect from contact with the lubricant.</u>		Möbelfakta
1.5 <u>Knock-down furniture / assembly instructions.</u> Parts or components being parts of a knock-down furniture shall be so prepared that the assembly can be done without any difficulties and in a reliable way. When the assembly requires an instruction it shall be easy to understand and instructive. The instruction shall by a list, a diagram or in another way make it possible to control that all parts or components are supplied.		Möbelfakta

## Appendix 1

**4.2. Contract use****4.2.1 Seating**

<b>2. Stability</b>		<b>References: Test method</b>
2. The seating shall not overturn. The stability requirements shall be fulfilled before and after the tests specified in clause 3 - Safety and Strength and Durability (performance).	√	SS-EN 1022

<b>3. Test</b>	<b>Reference</b>	<b>Load</b>	<b>Cycles</b>	<b>Level 2</b>
3.1 Seat and back static load test	SS-EN 1728.Clause.6.2.1	Seat: Back:	10	1600 N 560 N √
3.2 Seat front edge static load test	SS-EN 1728.Clause.6.2.2		10	1600 N √
3.3 Additional seat and back static load test for tilting chairs, reclining chairs and loungers	SS-EN 1728.Clause.6.3	Seat: Back:	10	1) 1600 N 560 N max
3.4 Vertical static load on back	SS-EN 15373 Annex A.2	Back:	10	600 N Seat load: 1300 N √
3.5 Foot rail/foot rest and leg rest static load test	SS-EN 1728.Clause.6.4		10	1300 N
3.6 Arm sideways static load test	SS-EN 1728. Clause.6.5		10	600 N
3.7 Wing sideways static load test	SS-EN 1728. Clause.6.5		10	400 N
3.8 Arm downwards static load test <sup>7</sup>	SS-EN 1728. Clause.6.6		10	900 N
3.9 Vertical upwards static load on armrest	SS-EN 15373 Annex A.1		10	Seat load: 1000 N

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## 4.2. Contract use

## 4.2.1 Seating

3. Test	Reference	Load	Cycles	Level 2
3.10 Seat and back fatigue test	SS-EN 1728.Clause.6.7	Seat: 1000 N Back: 300 N		100 000 cycle √
3.11 Additional seat and back fatigue test for tilting chairs, reclining chairs and loungers	SS-EN 1728.Clause.6.9	1) Seat: 1000 N Back: 300 N		100 000 cycle
3.12 Seat front edge fatigue test	SS-EN 1728.Clause.6.8	1000 N		50 000 cycle √
3.13 Arm fatigue test	SS-EN 1728.Clause.6.10	400 N		50 000 cycle
3.14 Leg rest fatigue test	SS-EN 1728.Clause.6.11	1000 N		50 000 cycle
3.15 Foot rail fatigue test	SS-EN 15373 Annex A.1	1000 N		50 000 cycle
3.16 Leg forward static load test	SS-EN 1728.Clause.6.12	Under frame: Seat:	10	620 <sup>1</sup> N 1300 N √
3.17 Leg sideways static load test	SS-EN 1728.6.13	Under frame: Seat:	10	490 N 1300 N √
3.18 Diagonal static base load test	SS-EN 1728.Clause.6.14		10	500 N
3.19 Seat impact test	SS-EN 1728.Clause.6.15	Drop height	10	240 mm √
3.20 Back impact test	SS-EN 1728.Clause.6.16	Drop height	10	330 mm √
3.21 Arm impact test	SS-EN 1728.Clause.6.17	Drop height	10	330 mm
3.22 Drop test (multiple seating)	SS-EN 1728.Clause.6.18	Drop height	2x5	300 mm

<sup>1</sup> Leg forward static load test 620 N, according to Möbel fakta

## Appendix 1

## 4.2. Contract use

## 4.2.1 Seating

3. Test	Reference	Load	Cycles	Level 2
3.23 Auxiliary writing surface static load test	SS-EN 15373 Annex A.3		10	300 N
3.24 Auxiliary writing surface fatigue test	SS-EN 15373 Annex A.3	150 N		20 000 cycle
1) Stress levels shall be calculated according to formulas in SS-EN 1728				

√ The test has been completed without any remarks

⊗ The requirement is not fulfilled

### Assessment of results

#### Safety:

After carrying out the tests, the tested piece of furniture did not demonstrate any ruptures, fractures or other damage that can affect the safe use of the article as per SS-ENV 12520. This also implies that after the testing there are no burrs, sharp edges or sharp points. See clause 1.1.

#### Strength and durability (performance):

After carrying out the tests the tested piece of furniture did not demonstrate any ruptures, fractures or other damage that can affect the durability or appearance as:

- Fracture of any member, component or joint.
  - Loosening of any joint intended to be rigid.
  - Deformation or wear of any part or component such that it's functioning is affected.
  - Loosening of any means of fixing components.
  - Any movable parts that no longer open or close freely, or catches that do not operate properly.
  - Clearly audible noise.
  - The height change of upholstery.
- When tested according to clause 3.8 or 3.9 alternatively the height change of the seat shall not exceed 25 mm.
- Assessment of the height change shall be carried out according to the method described in prEN 14443: Domestic furniture – Seating – Test methods for the determination if durability of upholstery

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4.2. Contract use

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## Pictures

*Picture 2 Fastening of the chair legs in the seat shell*

