

**Product** Form chair with sled base 2806D

**Test requested by** Martela Oyj, Takkatie 1, 00370 Helsinki

**Test specimen** Seat shell: laminated veneer shell  
Base: Powder coated steel wire  
Arm rests: Black ABS  
Glides: Black PP + felt glide

**Test method** Determination of strength, durability and safety of non-domestic chair according to EN 15373:2007 Furniture – Strength, durability and safety – Requirements for non-domestic seating



The test specimen was selected by Martela and arrived at Research center February 11, 2013.

Tests were carried out 11.02.2013 – 25.02.2013 in temperature between 15°C and 25°C.

**Results** Testing methods and results are explained in tables 1-3.

#### Assessment of the results

Form chair 2806D meets the requirements of non-domestic seating for strength, durability and safety as presented in the EN 15373:2007 with level 2 type of usage.

The test result is only valid to the specimen tested and no other.

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#### Martela research Center

Nummela, March 19, 2013

approved by:

Kimmo Sundström  
R&D Manager

tested by:

Tero Karttunen  
Laboratory Engineer

Ref. Test report No.1075

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<b>Test severity in relation to applications</b>			
The table below shows the type of use that might be expected from furniture in relation to the three test severities contained in Table 3.			
Test severity	Type of use	Application	Used severity
1	Light	Hotel bedroom, church, libraries	
2	General	General hotel, café, restaurant, public hall, banks, bars, meeting rooms	X
3	Severe	Night-club, police station, transport terminals, hospital public areas, casino, homes for the elderly, sports changing rooms, prisons, barracks	

<b>Table 1</b>		<b>EN15373:2007 Safety</b>	
Reference to standard	Requirements	Record	RESULTS
<b>5.1 General</b>	Edges of the seat, back rest and arm rests which are in contact with the user when sitting in the seating are rounded or chamfered and all other edges accessible during use are free from burrs and/or sharp edges	Record whether the requirements are filled	OK
	Ends of hollow components are closed or capped		OK
	Movable and adjustable parts shall be designed so that injuries and inadvertent operation are avoided		OK
	It shall not be possible for any load bearing part of the seating to come loose unintentionally		OK
	All parts that are lubricated to assist sliding shall be designed to protect users from lubricant stains when in normal use		N/A
<b>5.2.1 Shear and squeeze points when setting up and folding</b>	Shear and squeeze points only during setting up and folding are acceptable.	Record whether the requirements (less than 18 mm or more than 7 mm) are filled.	OK
<b>5.2.2 Shear and squeeze points under influence of powered mechanism</b>	With the exception of tipping seats there shall be no shear and squeeze points created by parts of the seating operated by powered mechanism, e.g. springs and gas lifts		OK
<b>5.2.3 Shear and squeeze points during use</b>	There shall be no shear and squeeze points created by forces applied during normal use. Forces mentioned in strength, durability and safety testing table.		OK
	There shall be no shear and squeeze points if a hazard is created by the weight of the user during normal movements and actions, e.g. attempting to move the seating by lifting the seat or by adjusting the backrest	OK	

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<b>Table 2</b>		<b>EN15373:2007 Stability</b>		
<b>Tests</b>	<b>Requirements</b>		<b>Swivelling chair</b>	<b>Non swivelling chair</b>
<b>5.3.1 General</b> EN15373:2007	The seating shall not overturn under the following conditions by:	a) pressing down on the front edge of the seat surface in the most adverse position	5.1 of EN1335-3:2000	6.2 of EN1022:2005
		b) leaning sideways on a seat with or without arm rests	5.3 of EN1335-3:2000	6.4 or 6.5 of EN1022:2005
		c) leaning against the back rest	5.4.2 and 5.4.3 of EN1335-3:2000	6.6 (or 7) of EN1022:2005
		d) sitting on the front edge of the seat	5.2 of EN1335-3:2000	6.2 of EN1022:2005
		e) loading the foot rail/foot rest	6.3 of EN1022:2005	6.3 of EN1022:2005
<b>5.3.2 Swivelling chairs</b>				<b>Result</b>
<b>5.3.1 a)</b> 5.1 of EN1335-3:2000 <b>Front edge overbalancing</b>	1 cycle 27 kg, hang freely	point on the front edge furthest from rotation axis		N/A
<b>5.3.1 b)</b> 5.3 of EN1335-3:2000 <b>Sideways overbalancing</b>				
5.3.1 Without arm rests	600N on the seat Horizontal 20N	60mm from the edge, nearest the stopped supporting points most likely to result in overbalancing		N/A
5.3.2 With arm rests	250N on the seat 350N on the arm rest	100mm to the side of the median plane Max 40mm inwards from the outer edge, most adverse position along its length		
<b>5.2 Forwards overbalancing</b>	1 cycle 600N on the seat	Horizontal 20N at least 5sec		N/A
<b>5.3.1</b> EN15373:2007	Fulfilled if either someone is	1) Seating has at least five supporting points and the maximum offset [m] of the back rest of the chair is smaller than or equal to 1,34*[t] 2) Seating does not overturn when tested in accordance with 5.4.3 and 5.4.3 of EN1335-3:2000		N/A
<b>6.3 Forwards overturning for seating with footrest</b> EN1022:2005	600N on the footrest	Horizontal 20N at least 5sec		N/A
<b>5.3.3 Non swivelling chairs</b>				<b>Result</b>
<b>6.2 Forwards overbalancing, all seating</b> EN1022:2005	600 on the seat	Horizontal 20N at least 5sec from the seat height level		OK
<b>6.4 Sideways overbalancing, all seating without arms or</b> <b>6.5 Sideways overbalancing, all seating with arms</b> EN1022:2005	600N on the seat Horizontal 20N  250N on the seat 350N on the arm rest	60mm from the edge, nearest the stopped supporting points most likely to result in overbalancing  100mm to the side of the median plane Max 40mm inwards from the outer edge, most adverse position along its length		N/A  OK
<b>6.6 Rearwards overbalancing, all seating with backs</b> EN1022:2005	600N on the seat on point A	Determine seat height H. For seating having a value of $H \geq 720\text{mm}$ use force F of 80N $F = 0.2857 * (1000 - H)$		OK
<b>6.3 Forwards overturning for seating with footrest</b> EN1022:2005	Repeat procedure 6.2 applying the vertical and horizontal loads to the footrests.			N/A
<b>5.4 Rolling resistance of the unloaded chair</b> EN1335-3:2000	Rolling resistance $\geq 15\text{N}$ Rolling resistance $\geq 12\text{N}$	With castor type H or With castor type W  Record the force used to push or pull over distance from 250mm to 500mm as the rolling resistance.		N/A N/A

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Table 3	EN15373:2007 Strength and durability				
	Test	Loading	Test severity		
		1	2	3	RESULTS
1. Seat and back static load EN 1728:2000: 6.2.1	Seat: force N Back: force N 10 times	1600 560	<u>1600</u> <u>560</u>	2000 700	OK
2. Seat front edge static load test EN 1728:2000: 6.2.2	Force, N 10 times	1300	<u>1600</u>	2000	OK
3. Additional seat and back static load test for tilting chairs, reclining chairs and loungers EN 1728:2000: 6.3	Seat: force N Back: force N 10 times	1600 560	<u>1600</u> <u>560</u>	2000 700	N/A
4. Vertical static load on back Annex A.2	Force, N 10 times	-	<u>900</u> <u>seat load:</u> <u>1250</u>	1100 seat load: 1800	N/A
5. Foot rail/ foot rest and leg rest static load test EN 1728:2000: 6.4	Force, N 10 times	1000	<u>1300</u>	1600	N/A
6. Arm sideways static load test EN 1728:2000: 6.5	Force, N 10 times	400	<u>600</u>	900	N/A
7. Wing sideways static load test EN 1728:2000: 6.5	Force, N 10 times	300	<u>400</u>	600	N/A
8. Arm downwards static load test EN 1728:2000: 6.6	Force, N 10 times	800	<u>900</u>	1000	OK
9. Vertical upwards static load on arm rests Annex A.1	Lift 10 times	-	<u>seat load</u> <u>1000 or</u> <u>lift stack</u>	seat load 1200 or lift stack	N/A
10. Seat and back fatigue test EN 1728:2000: 6.7	Cycles Seat: 1000 N Back: 300 N	100000	<u>150000</u>	200000	OK
11. Additional seat and back fatigue test EN 1728:2000: 6.9	Cycles Seat: 1000 N Back: 300 N	100000	<u>150000</u>	200000	N/A
12. Seat front edge fatigue test EN 1728:2000: 6.8	Cycles Force: 1000 N	50000	<u>75000</u>	10000	OK
13. Arm fatigue test EN 1728:2000: 6.10	Cycles Force: 400 N	30000	<u>50000</u>	100000	OK
14. Leg rest fatigue test EN 1728:2000: 6.11	Cycles Force: 1000 N	30000	<u>50000</u>	100000	N/A
15. Foot rail fatigue test Annex A.1	Force: 1000 N	-	<u>50000</u>	100000	N/A
16. Leg forwards static load test EN 1728:2000: 6.12	Force, N Seat load N 10 times	400 1000	<u>500</u> <u>1250</u>	760 1800	OK
17. Leg sideways static load test EN 1728:2000: 6.13	Force, N Seat load N10 times	400 1000	<u>490</u> <u>1250</u>	760 1800	OK
18. Diagonal static load test EN 1728:2000: 6.14	Force, N 10 times	375	<u>500</u>	620	N/A
19. Seat impact test EN 1728:2000: 6.15	Drop height, mm, 10 times	180	<u>240</u>	300	OK
20. Back impact test EN 1728:2000: 6.16	Height, of fall, mm <sup>0</sup> 10 times	210/38	<u>330/48</u>	620/68	OK
21. Arm impact test EN 1728:2000: 6.17	Height, of fall, mm <sup>0</sup> 10 times	210/38	<u>330/48</u>	620/68	OK
22. Drop test (multiple seating) EN 1728:2000: 6.18	Drop height, mm, 2x5 times	200	<u>300</u>	450	N/A
23. Auxiliary writing surface static load test Annex A.3	Force, N 10 times	200	<u>300</u>	300	N/A
24. Auxiliary writing surface fatigue test Annex A.4	Cycles Force 150 N	10000	<u>20000</u>	20000	N/A
<b>DEFECTS AND OBSERVATIONS AFTER TEST PROCEDURE</b>	None				

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