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## Test of child safety locking device for windows

(1 appendix)

### Summary

An non integrated locking device for windows, 3845 PN Lock bar with casement fasteners, has been tested according to EN 16281:2013, SS 3587 and paragraph 7 of the Nordtest method NT CONS 018. PN Lock Bar 3845 has previously been tested (PX18507, 2012-01-20) and now additional test are performed to also fulfil requirements of EN 16281.

The device fulfilled the requirements in EN 16281:2013, SS 3587 and NT CONS 018 in all performed tests.

### 1 Introduction

SP has been commissioned by A/S Peder Nielsen Beslagsfabrik to perform tests of a childproof locking device for windows according to EN 16281:2013, SS 3587 and paragraph 7 of the Nordtest method NT CONS 018.

### 2 Test object

Designation:	3845 PN Lock bar with casement fasteners
Material:	Steel.
Selection of test object:	Performed by the client without assistance from SP.
Arrival of test object:	2008-09-04 PN Lock Bar 3800 2012-12-14 PN Lock Bar 3835 2015-04-21 3845 PN Lock Bar with casement fasteners



Picture 1 3845 PN Lock bar with casement fasteners, child safety locking device

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### 3 Test performance

Test methods:	Function test (child safety): Paragraph 7 of NT-CONS 018, ed. 1990-09. EN 16281:2013. SP is not accredited for these methods. Other tests: SS 3587 'Byggnadsbeslag – Barnskyddande beslag för fönster och fönsterdörrar – Hållfasthet – Krav och provning', 1 <sup>st</sup> ed.
Test dates:	September 2008 –November 2008 (3800) December 2011 (3835), September 2015 (3845)
Place of testing:	The mechanical tests were performed by the department Building Technology and Mechanics and the ageing tests by the department Chemistry and Materials Technology, both of SP in Borås, Sweden. The child safety function tests were performed at a preschool outside Borås, as specified below.
Preschool:	Götagården, Borås 2008-10-03* Lorensbergsgården, Borås 2008-10-08* Trollgården, Borås 2008-11-12*. <i>* tested in report PX18507 (2012-01-20).</i>

#### 3.1 Test program

The test program is shown in Table 1. Short descriptions of the performed tests are presented in respective subchapter of Chapter 4 where all similar tests from the different standards are under the same subchapter.

**Table 1 Test program**

Test	Reference	Test
1	NT 7*	Function test (child safety)
2	7.1**	Ageing
3	7.2**	Wear of opening restriction
4	9.1**	Static loading
5	9.2**	Impact testing
6	9.3**	Stamping test
7	5.4.4***	Child test
8	5.5.1***	Ageing
9	5.5.2***	Durability of opening restriction
10	5.5.3***	Durability of locking mechanism
11	5.5.4***	Mechanical protective function test
12	5.5.5***	Structural integrity test
13	5.5.6***	Percussion test
14	5.5.7***	Stamping test
15	5.5.8.2***	Torque test
16	5.5.8.3***	Tension test
17	5.5.9***	Small ball tests
18	5.5.10***	Sharp edges test
19	4.6***	Purchase information
20	4.7***	User information
21	4.8***	Marking of product

\* NT-CONS 018 chapter 7, \*\* SS 3587, \*\*\* EN 16281

## 4 Results

All results shown in this report refer only to the tested samples. Each test is shortly described in the following subchapters. The numbers in parenthesis in each heading refer to the corresponding paragraphs in the used standards. The same test samples are used for tests of all standards and not tested twice for the same tests. All test results refer to previous test in report (PX18507, 2012-01-20) except chapter 4.4-4.6, 4.9- 4.15 are the performed addition test for EN 16281.

### 4.1 Function test / child test (Child safety NT-CONS 018, 5.4.4 EN 16281)

This test is designed to assess the child safety of the device according to NT- Cons 018. The test was performed with a group of children aged 36 -60 months, with uniform age and sex distributions. Each child has five minutes to try to open the window by disengaging the device without being shown how to do. If the child does not succeed, the test leader shows how to disengage the device and the child gets another five minutes to try to open the window.

The tested device fulfils the requirements\*.

One child managed to disengage the device. The test panel consisted of 36 children.

Requirement: A maximum of 2 children out of 32 are allowed to disengage the device.

*\*This test was performed in report PX18507 (2012-01-20) with the previous type of locking device that was longer. The new locking device are shortened to fulfil EN 16281 requirement of maximum 89 mm opening restriction and added integrated casement fastener with adjustments possibilities. Since the locking function for children has not change and the younger child test group(42-51 months) in EN 16281 its deemed not to be retested.*

### 4.2 Ageing (7.1, SS 3587, 5.5.1, EN 16281)

The devices are made (partly) of polymers are submitted to 400 hour of UV outdoor light and an increased temperature of 70° C for 3000 hours.

This test is not applicable for the tested device since its made of steel.

### 4.3 Wear/durability of opening restriction (7.2, SS 3587, 5.5.2, EN 16281)

The device is mounted on a window according to its instruction manual. The window is opened until the device restricts the movement with a force of 55 N. Then the window is closed again. This is repeated for a total of 25000 cycles.

Two samples were tested. Both fulfil the requirements.

### 4.4 Durability of locking mechanism (5.5.3, EN 16281)

The locking mechanism are engaged and disengaged for a total of 1500 cycles.

Two samples were tested. Both fulfil the requirements

#### **4.5 Mechanical protective function test (5.5.4, EN 16281)**

A force of 350 N was submitted to the sash. The load is maintained for one minute and during that time its checked if the test probe A can pass between the frame and the sash.

Two samples were tested. Both fulfil the requirements

#### **4.6 Static loading / Structural integrity test (9.1 SS 3587, 5.5.5 EN 16281)**

With the device engaged, the window is submitted to a load of  $F_1 = 500$  N in the opening direction at the point which implies the most onerous condition for the safety locking device. The load is maintained for one minute. The procedure is repeated three times.

The uniting part of the device is then submitted to a load of 200 N in a direction perpendicular to  $F_1$ . The load is maintained for one minute. The procedure is repeated three times.

Two samples were tested. Both fulfil the requirements.

#### **4.7 Impact/Percussion test (9.2, SS 3587, 5.5.6, EN 16281)**

The device is subjected to impact loading 10 times with a defined pendulum. The pendulum hit the smaller mounting who seems to be the weakest part.

Two samples were tested. Both fulfil the requirements.

#### **4.8 Stamping/cutting test (SS 3587 9.3, 5.5.7 EN 16281)**

The part of the device uniting the window frame and casement is stamped with a defined equipment and a load of 3600 N.

Two samples were tested. Both fulfil the requirements.

#### **4.9 Torque test (5.5.8.2, EN 16281)**

Components that can be gripped between thumb and forefinger shall be applied a torque of 0.34 Nm or maximum 180°.

Two samples were tested. Both fulfil the requirements.

#### **4.10 Tension test (5.5.8.3, EN 16281)**

Any small component , which is removable or becomes detached when tested, shall not fit wholly within the small part cylinder.

Two samples were tested. Both fulfil the requirements.

#### **4.11 Small balls test (5.5.9, EN 16281)**

Any small ball, which is removable or becomes detached when tested, shall not entirely pass through the small ball template.

Two samples were tested. Both fulfil the requirements.

#### **4.12 Sharp edges test (5.5.10, EN 16281)**

There shall be no accessible edges that present an unreasonable risk of injury.

Two samples were tested. Both fulfil the requirements.

#### **4.13 Purchase information (4.6, EN 16281)**

Requirements fulfilled.

#### **4.14 User information (4.7, EN 16281)**

Requirements fulfilled.

#### **4.15 Marking of product (4.8, EN 16281)**

Requirements fulfilled.

### **5 Measurement uncertainty**

The total calculated measurement uncertainty for the force is  $< 2\%$ , the length measurement uncertainty using a micrometer is  $< 0.01$  mm, the length measurement uncertainty using a measuring tape is  $< 0.5$  mm, torque  $< 2\%$  and the uncertainty of the dead weight is  $< 0.5\%$ .

Reported uncertainties correspond to an approximate 95 % confidence interval around the measured value. The interval has been calculated in accordance with GUM (The ISO guide to the expression of uncertainty in measurements), which is normally accomplished by quadratic addition of the actual standard uncertainties and multiplication of the resulting combined standard uncertainty by the coverage factor  $k=2$ .

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Performed by

Examined by

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#### **Appendix**

Drawings of PN Lock Bar 3845 (4 pages).

Appendix 1

Pat.pending 03388071.7

(D) Must carry its own weight but be movable by light finger force

After surface treatment (A.3) 11 ±0.3

5.7 ±0.3

No powder coating in threads

After surface treatment (A.3) 8.9

After surface treatment: 30 g ±280 g (A.4)

Friction joint must hold the arms weight and an additional 30g to 280g (A.4)

> 280 g (A.4)

Scale 1:2

Friction joint must not hold the arm weight and additional weight > 280 g (A.4)

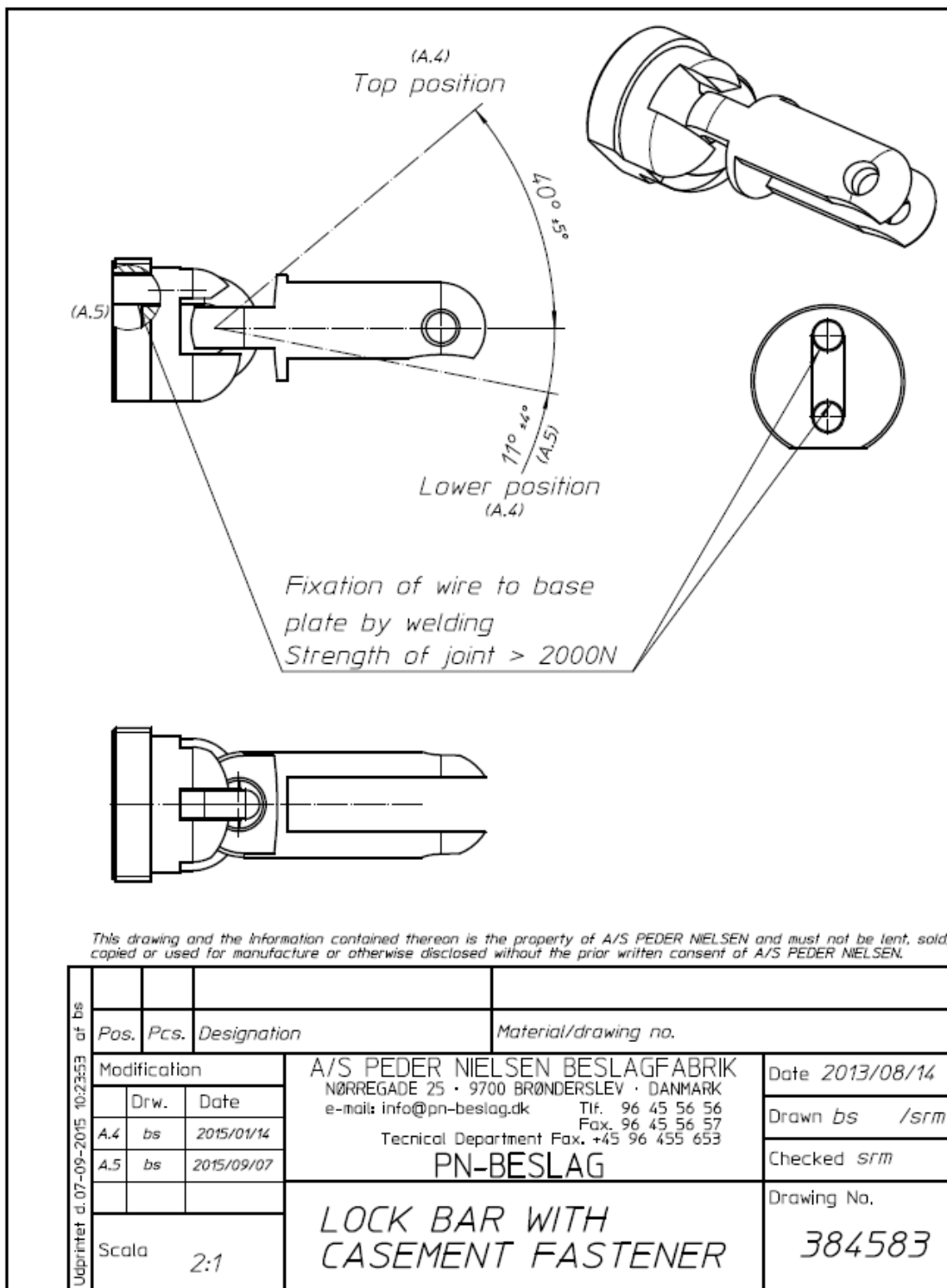
Scale 1:2

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Pos.	Pcs.	Designation	Material/drawing no.
Modification			
Drw. <td>Date <td colspan="2">A/S PEDER NIELSEN BESIAGFABRIK NARREGADE 25 · 9700 BRUNSBÜL · DANMARK e-mail: info@pn-beslag.dk · Tel: 96 45 56 56 Fax: 96 45 56 57 Technical Department Fax: +45 96 45 56 55</td> </td>	Date <td colspan="2">A/S PEDER NIELSEN BESIAGFABRIK NARREGADE 25 · 9700 BRUNSBÜL · DANMARK e-mail: info@pn-beslag.dk · Tel: 96 45 56 56 Fax: 96 45 56 57 Technical Department Fax: +45 96 45 56 55</td>	A/S PEDER NIELSEN BESIAGFABRIK NARREGADE 25 · 9700 BRUNSBÜL · DANMARK e-mail: info@pn-beslag.dk · Tel: 96 45 56 56 Fax: 96 45 56 57 Technical Department Fax: +45 96 45 56 55	
A.4	20/02/24	Date 2013/08/14	
A.5	20/04/13	Drawn by /srm	
Scale 1:1		Checked srm	
		Drawing No. 384582	
LOCK BAR WITH CASEMENT FASTENER			

Colour (A.3)	1st surface treatment	2nd surface treatment
Silver	Electroalvanized min. 16µ	Powder coated Special PN silver
White	Electroalvanized min. 16µ	Jotun silver 2 A107678A 60-100µ
Chrome	Electroalvanized min. 16µ	Powder coated RAL 9010 60-100µ
Galv. Yellow	Electroalvanized min. 16µ with transparent yellow varnish	Mat chrome
Galv. Blue	Electroalvanized min. 16µ with transparent blue varnish	None
		None

Appendix 1



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Appendix 1

