

# Certificate of Crash Test according to

## **ISO 10542-1:2012 Wheelchair tiedown and occupant-restraint systems - SWM & ISO 7176-19 – 2008 Wheeled mobility devices for use as seats in motor vehicles**

This report serves solely as documentation for the test results. The tested objects have been selected by the client without the assistance of Dahl Engineering.

**Assignment:** Crash testing of wheelchair and WTORS according to ISO 7176-19 sections 5.2, 5.2.1 and 5.2.2. as well as ISO 10542 sections 5.2.4 and 5.2.5

**Date of testing:** 3 September 2018

**Test object/  
Wheelchair:** Scout X10 RWD with Dahl Docking WTORS

**Mass of wheelchair:** 127 kg.

**Serial no:** not informed – (proto type)

**WTORS:** Dahl WTORS that meet requirements set out in ISO 10542  
Wheelchair restraint system – Dahl Docking Station  
Occupant restraint – Dahl 3p. shoulder and lap belt #500984

**Test dummy/ATD:** The test was carried out using a Hybrid II 50% male dummy with a mass of 77 Kg.

**Measuring:** The deceleration was measured by accelerometers mounted on the crash test sled.

**Photography:** The test was filmed with a high speed camera at 500 fps.  
Still pictures, pre and post test, was also taken.

**Test results:** See page 2

**Sled deceleration****and speed:**

See page with plotted graph and speed

Section	Details	X if correct
<b>5.2.1</b>	<b>During the test</b>	
	<b>Horizontal excursion limits</b>	
	Wheelchair point P $\leq$ 200 mm [Xwc]	66
	ATD knee $\leq$ 375 mm[Xknee]	186
	ATD front of head $\leq$ 650 mm [XheadF]	449
	ATD rear of head $\leq$ 450 [XheadR]	-394
	The knee excursion exceeded the wheelchair P point excursion	X
	(Batteries on powered wheelchairs) did not move completely outside the wheelchair footprint or move into the wheelchair user's space or contact with ADT legs	X
<b>5.2.2</b>	<b>After the test</b>	
	The wheelchair remained in an upright position on the platform	X
	The ADT remained in the wheelchair with its torso at an angle of not more than 45° to the vertical, when viewed from any direction	X
	There were no visible signs of material failure on the wheelchair securing points	X
	There were no components, fragments or accessories of the wheelchair with a mass of more than 100g that completely separated from the wheelchair	X
	There were no fragmented or separated component, that may contact the occupant, produced with sharp edges less than radius 2 mm	X
	There were no visible signs of failure on the wheelchairs primary load carrying components	X
	There were no visible signs of failure on the wheelchairs seat adjusters	X
	The ADT was removed from the wheelchair without the use of tools	X
	The wheelchair was released from the tie-down system without the use of tools	X
	The post test decrease of the mean H-point height is not more than 20%	X

The presented samples meet the requirements set out in the above mentioned standard.

**Test Laboratory:**

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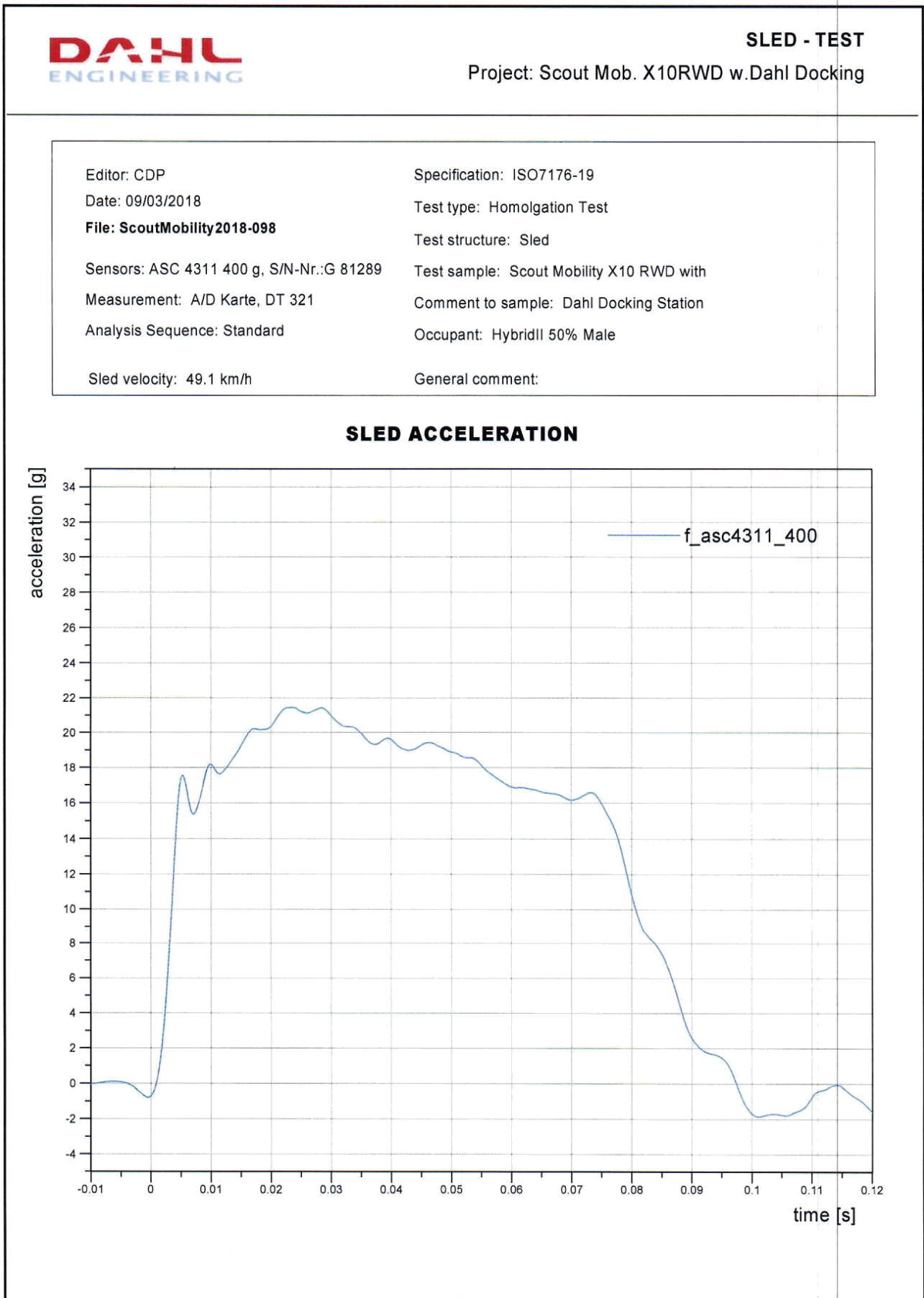
Thisted June 26 2019

Claus Dahl Pedersen

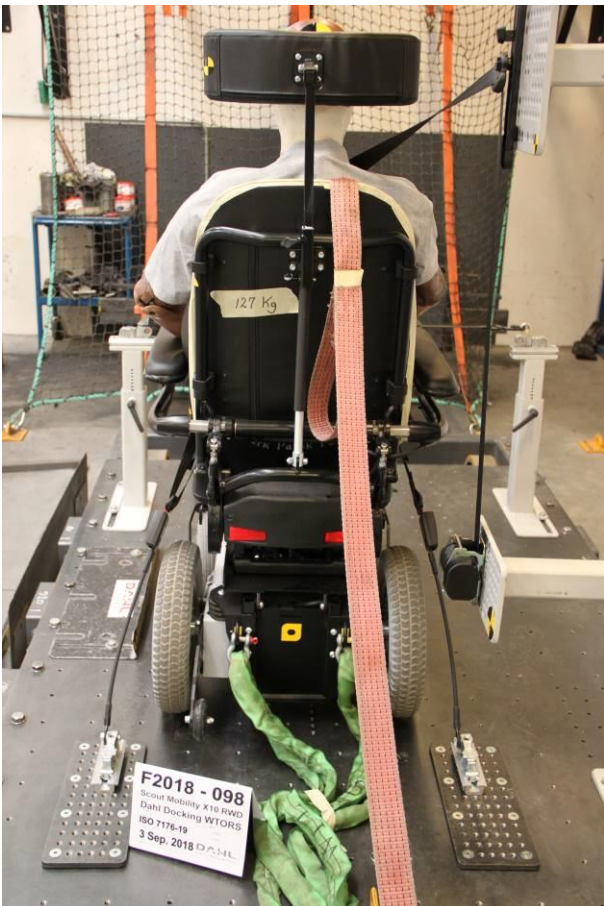
Head of test laboratory



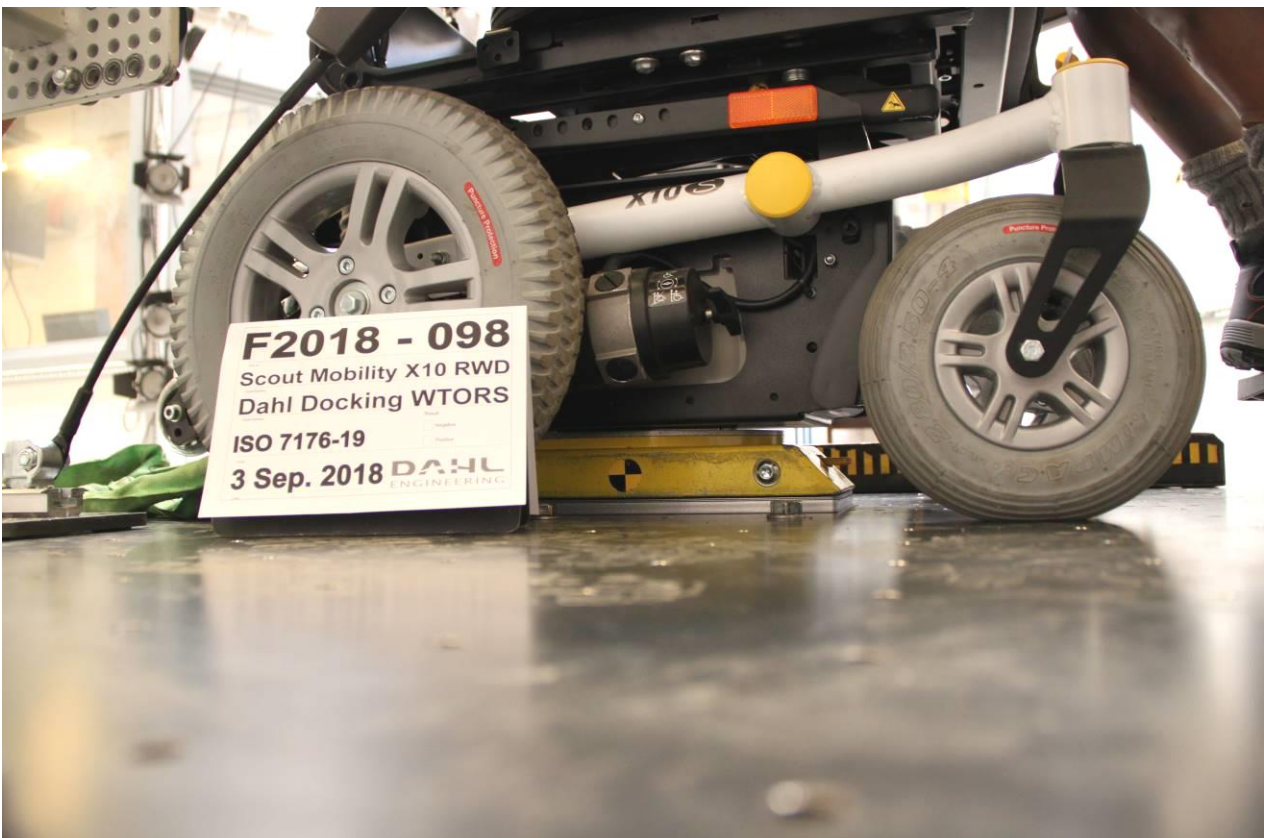
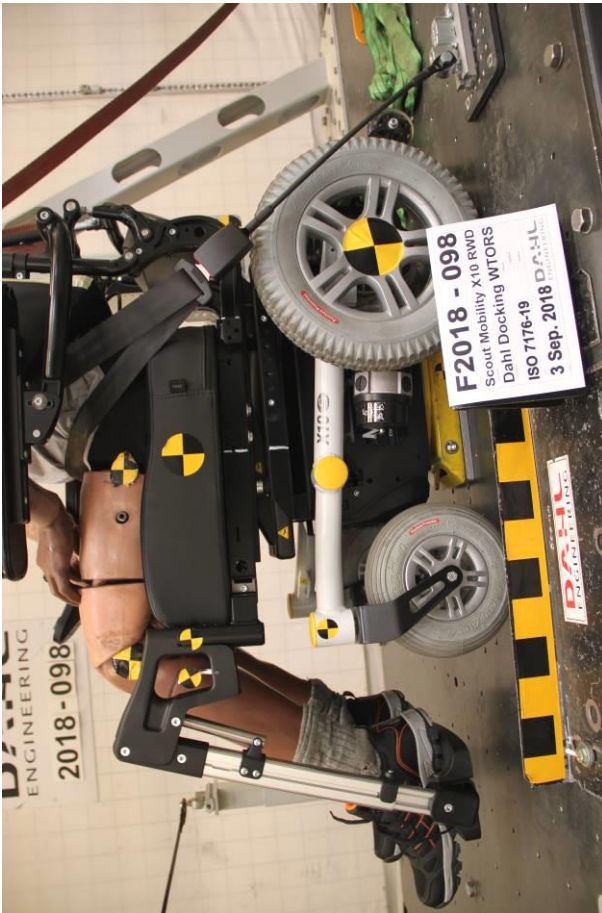
Plotted graph and speed



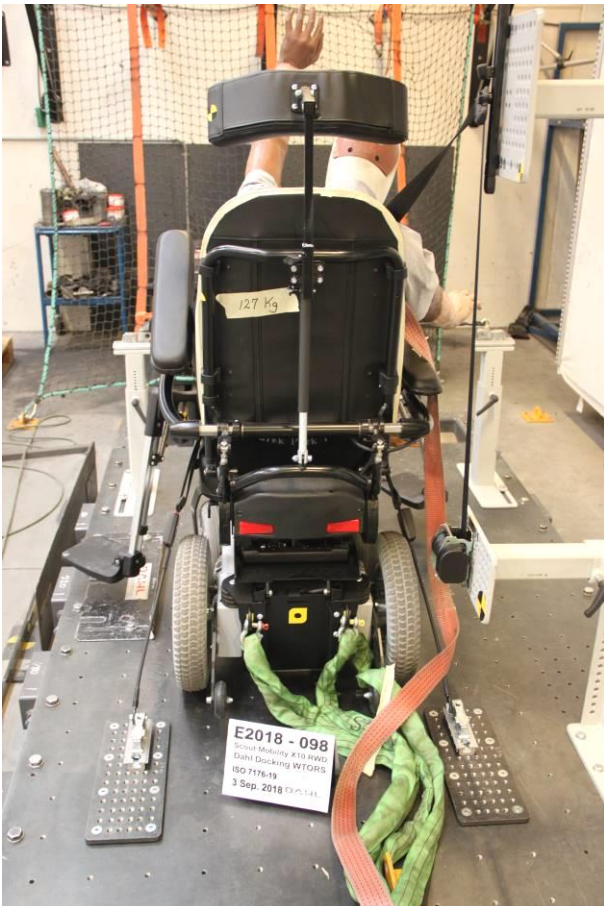
Pre- test photos



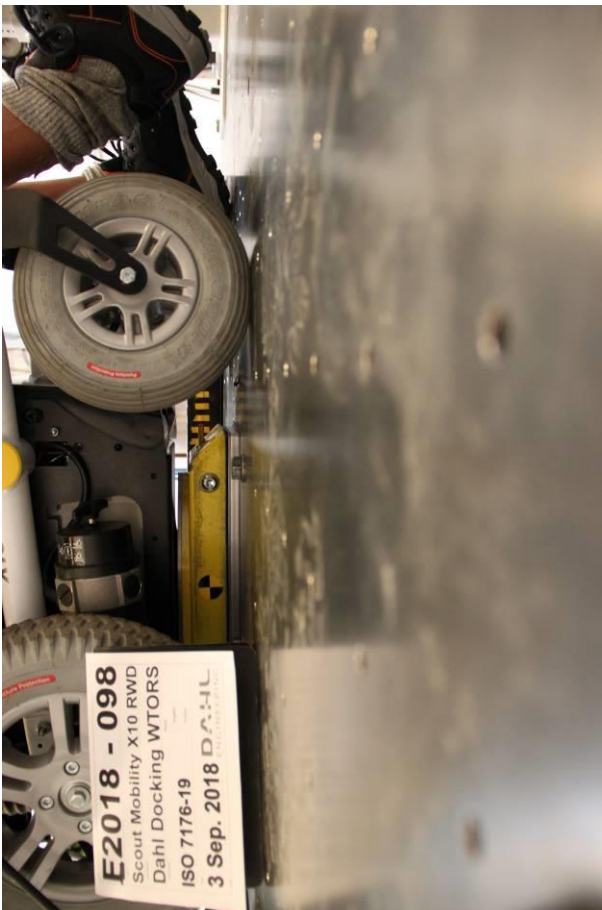
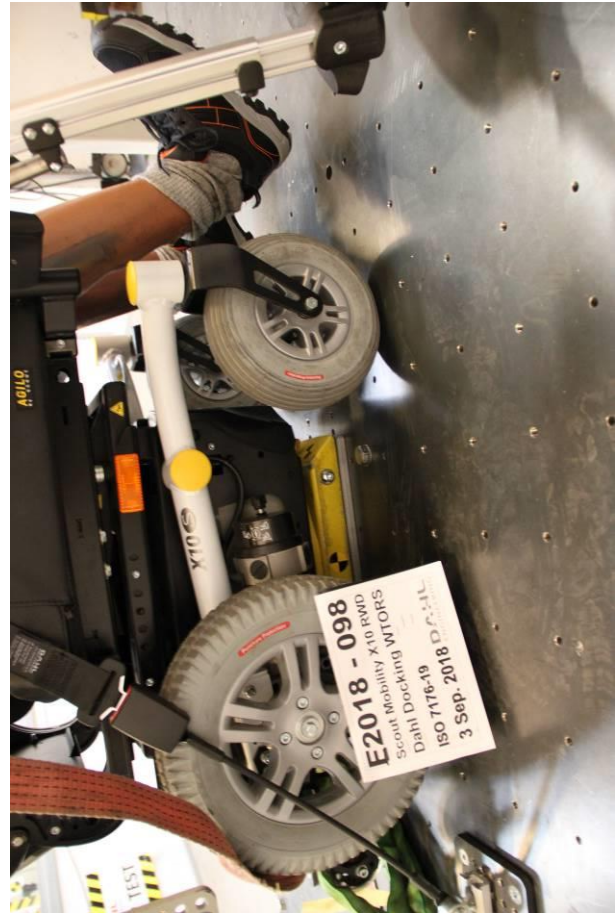
Pre- test photos



Post test photos



Post test photos



Post test photos

