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:	14 June 2018
Test object/ Wheelchair:	Dietz Sango M (Mid wheel drive) with docking adaptation for Dahl Docking System. With power adjustable back rest, seat tilt and foot rest.
Mass of wheelchair:	163,5 kg.
Serial no:	not informed
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.
Sled deceleration and speed:	See page with plotted graph and speed

Test results:

Section	Details	X if correct
5.2.1	**During the test**	
	Horisontal excursion limits	
	Wheelchair point P ≤ 200 mm [Xwc]	80
	ATD knee ≤ 375 mm[Xknee]	186
	ATD front of head ≤ 650 mm [XheadF]	438
	ATD rear of head ≤ 450 [XheadR]	-62
	The knee excursion exceeded the wheelchair P point excursion	X
	(Batteries on powered wheelchairs) did not move completely outside the wheel-chair footprint or move into the wheelchair user´s space or contact with ADT legs	X
5.2.2	**After the test**	
	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 45º 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.

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Thisted 15 June 2018

Claus Dahl Pedersen
Head of test laboratory

Plotted graph and speed

SLED - TEST

Project: Dietz Sango M w. Dahl Docking

Editor: CDP
Date: 06/14/2018
File: Dietz2018-064

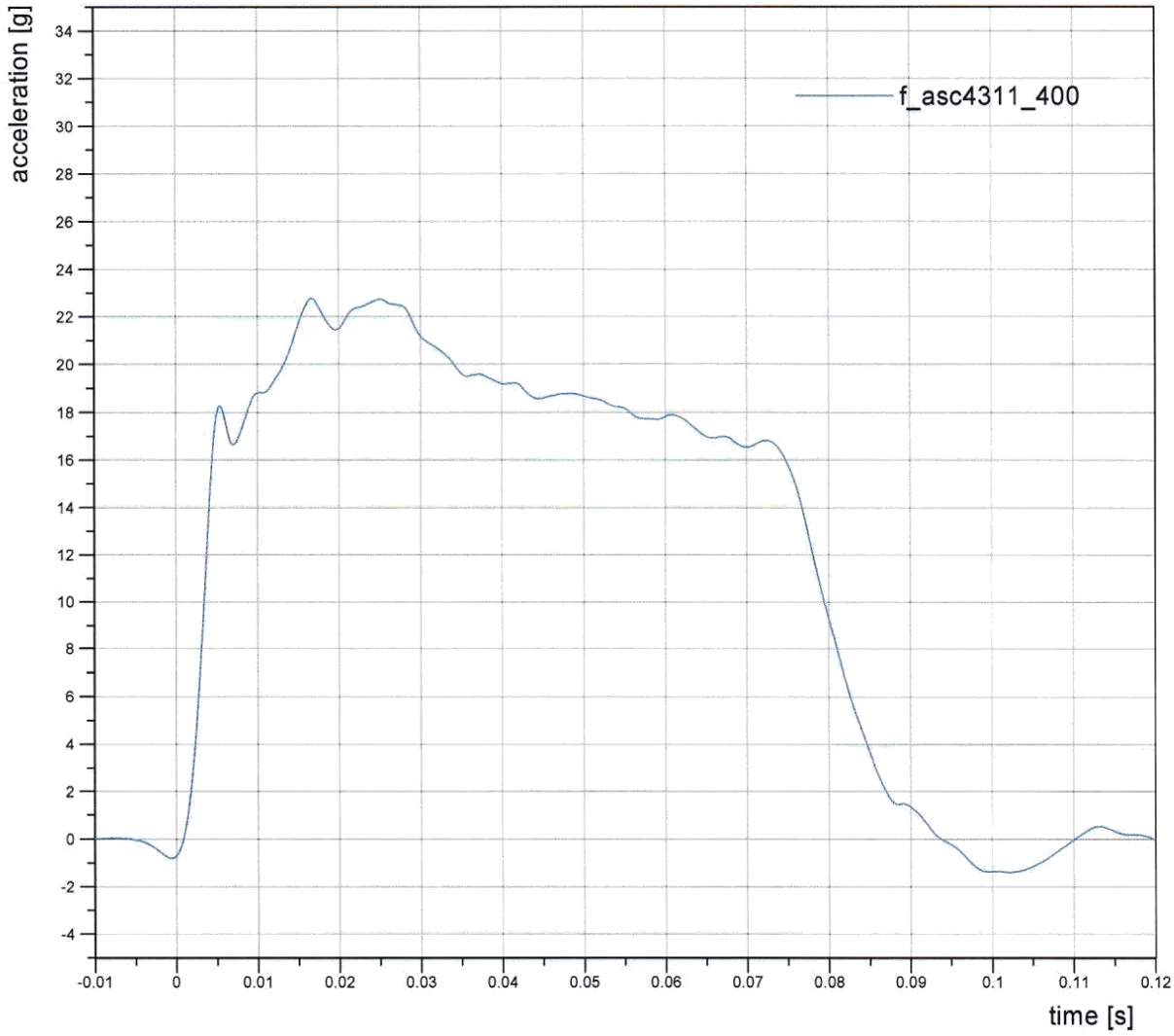
Sensors: ASC 4311 400 g, S/N-Nr.:G 81289
Measurement: A/D Karte, DT 321
Analysis Sequence: Standard

Sled velocity: 49.0 km/h

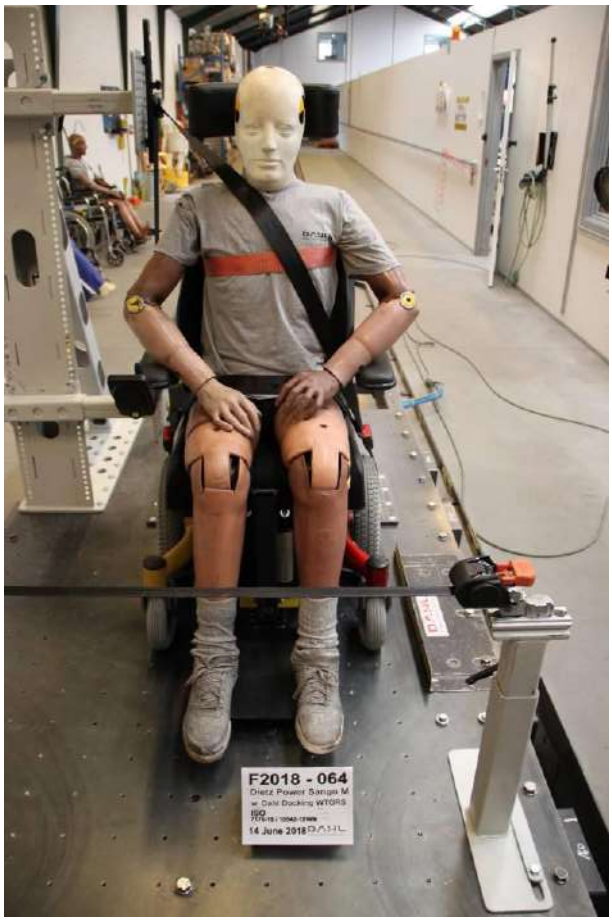
Specification: ISO10542 SWM / ISO7176-19
Test type: Homolgation Test
Test structure: Sled
Test sample: Dietz Power Sango M
Comment to sample: with Dahl Docking system
Occupant: HybridII 50% Male

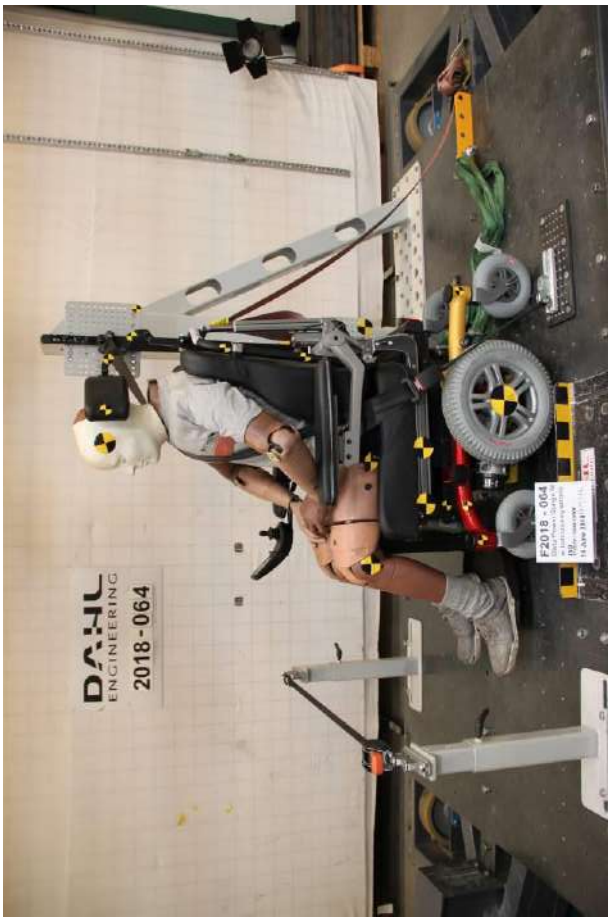
General comment:

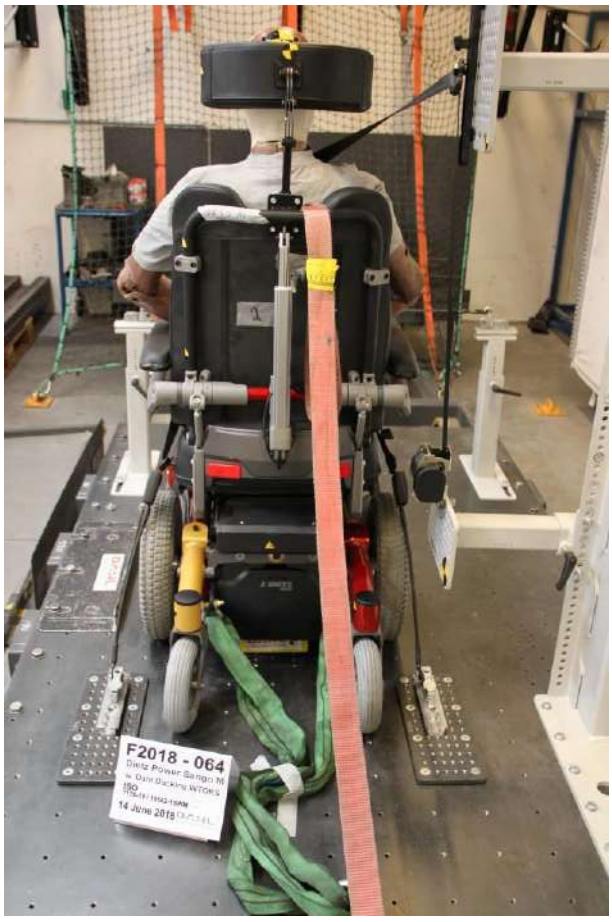
SLED ACCELERATION



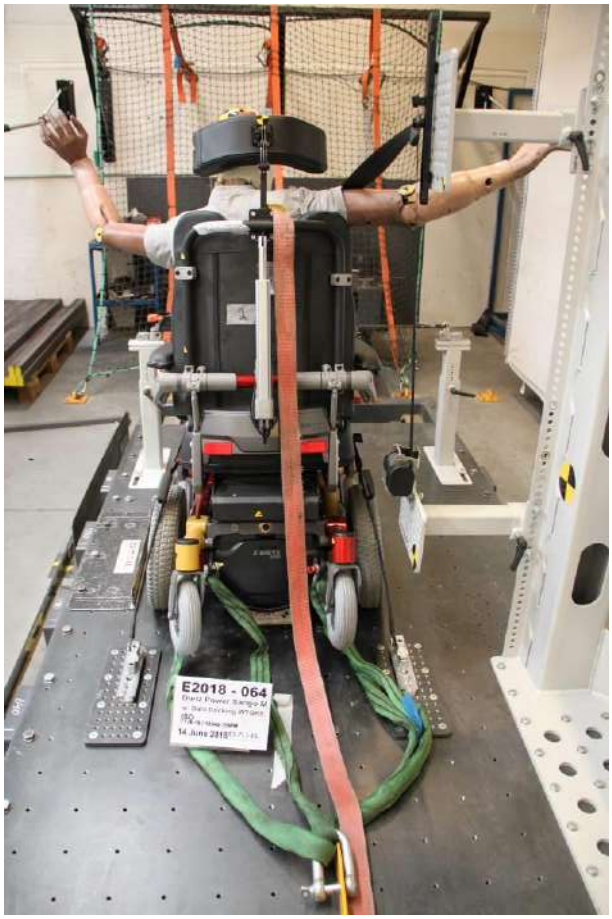
Pre- test photos







Post test photos



Post test photos