

MonZon Development AB

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Annual verification 2020 - U-plank Alu. 0,32x1,57 and U-plank Steel 0,32x1,57

(1 appendix)

Aluminium platforms with width 0.32 m and length 1.57 m (type examination certificate No. 394402, Frame ramställning) and Steel platforms with width 0.32 m and length 1.57 m (type examination certificate No. 394403, Modulställning Modular) were selected for the annual verification tests. RISE has tested the elastic deflection of the platforms.

The inspected platforms were in accordance with the type examination specifications and RISE recommends continued certification.

1 Introduction

In accordance with agreement between RISE and MonZon Development AB, Dnr 210-15-0267 and SPCR 064 Chapter 5, stiffness tests of Aluminium planks and Steel planks have been carried out.

Aim Stiffness test to verify that scaffold planks agree with certified samples.

Test location The laboratory of RISE Applied mechanics in Borås.

2 References

The testing and the evaluation have been carried out with the references to the following documents:

- [1] SP-Metod 4026 Ställningar – Utvärdering av bärförmåga enligt EN-standarder (*Scaffolds – Evaluation of the capacity in accordance with EN standards*), 2015-06-17.
- [2] SS-EN 12810-2:2004 Facade scaffolds made of prefabricated elements, Part 1: Particular methods of structural design, 2004-01-09 (**accredited test method**).
- [3] SS-EN 12811-1:2004 Temporary works equipment, Part 1: Scaffolds – Performance requirements and general design, 2004-01-09.
- [4] SS-EN 12811-3 Temporary works equipment, Part 3: Load testing, 2002-12-13 (**accredited test method**).

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Accred. No. 1002
Testing
ISO/IEC 17025

3 Selected test objects

Component	Aluminium planks for Monzon Frame ramställning, 0.32 x 1.57 m, 3 samples, and steel planks for Monzon Modulställning Modular, 3 samples.
Selection of test objects	Due to the corona pandemic a subsampling by a RISE representative could not be carried out. Therefore, the test objects were selected and sent to RISE by the customer.
Arrival of test objects	The test objects arrived at RISE in April 2020.

4 Scope

Six platforms were tested, three aluminium planks and three steel planks, see *Table 1*.

Table 1 Scope of the tests.

Type of test	Number of tests
Loading with concentrated load (F_2) on 200×200 mm	3+3
Loading with concentrated load (F_1) on 500×500 mm	3+3

5 Test method and performance

Test setup	The platforms were placed on steel beams, which were free to move in the parallel direction of the platform.
Test method	In accordance with [1] to [4].
Performance	See below.
Deformation rate	15 mm/min.
Dates of testing	2020-05-11.

5.1 Concentrated load 200×200 mm (F_2)

A loading plate of 200×200 mm was positioned in the middle of the span and close to one of the edges, see *Figure 1*. The displacement in the middle at the loaded edge was monitored throughout the loading cycle, which consists of increasing the load to 1.0 kN, keeping the load constant for one minute and unloading the platform.

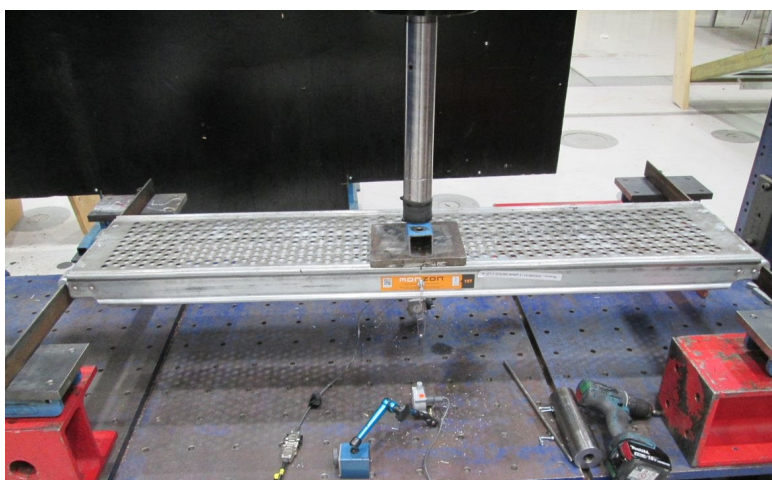


Figure 1 Test set-up for concentrated load on 200×200 mm.

5.2 Concentrated load on 500×500 mm (F_1)

A loading area of 500×500 mm was positioned in the middle of the span, see *Figure 2*. The displacement in the middle at both edges was monitored throughout the loading cycle, which consists of increasing the load to 1.5 kN, keeping the load constant for one minute, unloading the platform, increasing the load to 1.92 kN (3.0 kN scaled with 320/500), keeping the load constant for one minute and finally unloading the platform. The displacement was determined as the mean value from the two monitored edges.

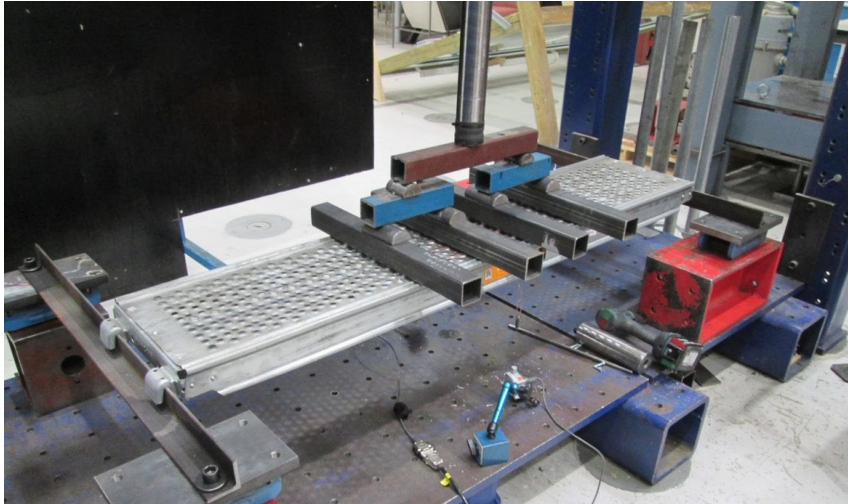


Figure 2 Test set-up for concentrated load on 500×500 mm.

6 Test results

6.1 Results of concentrated loads

The displacement results from the tests with the concentrated loads F_1 and F_2 are presented in *Table 2* for aluminium planks and *Table 3* for steel planks. Test results as load-displacement relationships are shown in *Appendix 1*. No failure occurred during these tests.

Table 2 Results of displacements from the tests with concentrated loads. Aluminium planks.

Type of loading	Load [kN]	Test results [mm]			Requirement		
Test No.		1	2	3	[mm]	load class	
F_2 on 200×200 mm	1.0	1.2	1.3	1.2	$\leq 15.7^{2)}$	1 - 6	fulfilled
F_1 on 500×500 mm	1.5	1.6	1.7	1.6	$\leq 15.7^{2)}$	1 - 3	fulfilled
	1.92 ¹⁾	2.1	2.2	2.0		4 - 6	fulfilled

¹⁾ 3.0 kN scaled down to 1.92 kN with the width of the platform.

²⁾ Platform length divided by 100.

Table 3 Results of displacements from the tests with concentrated loads. Steel planks.

Type of loading	Load [kN]	Test results [mm]			Requirement	
Test No.		1	2	3	[mm]	load class
F_2 on 200×200 mm	1.0	0.5	0.6	0.7	$\leq 15.7^{2)}$	1 - 6 fulfilled
F_1 on 500×500 mm	1.5	1.3	1.3	1.2	$\leq 15.7^{2)}$	1 - 3 fulfilled
	1.92 ¹⁾	1.6	1.6	1.6		4 - 6 fulfilled

¹⁾ 3.0 kN scaled down to 1.92 kN with the width of the platform.

²⁾ Platform length divided by 100.

The inspected platforms were in accordance with type examination specifications according to Table 4.

Table 4 Results from the verification of the platform.

Component	Measured load class type examination	Meets the requirement
Aluminium plank 0.57×1.57 m	6	Yes
Steel plank 0.57×1.57 m	6	Yes

7 Measurement uncertainty and miscellaneous

The measurement uncertainty for the load < 1 % and for the displacement < 3 %.

Reported uncertainty corresponds to an approximate 95 % confidence interval around the measured value. The interval has been calculated in accordance with EA-4/16 (EA guidelines on the expression of uncertainty in quantitative testing), which is normally accomplished by quadratic addition of the actual standard uncertainties and multiplication of the resulting combined standard uncertainty by the coverage factor $k=2$.

The test results only apply to the tested objects.

8 Corrective actions

No deviation was noted when the scaffold components was examined. No corrective actions is necessary.

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Appendix

1. Test results (2 pages)

Appendix 1

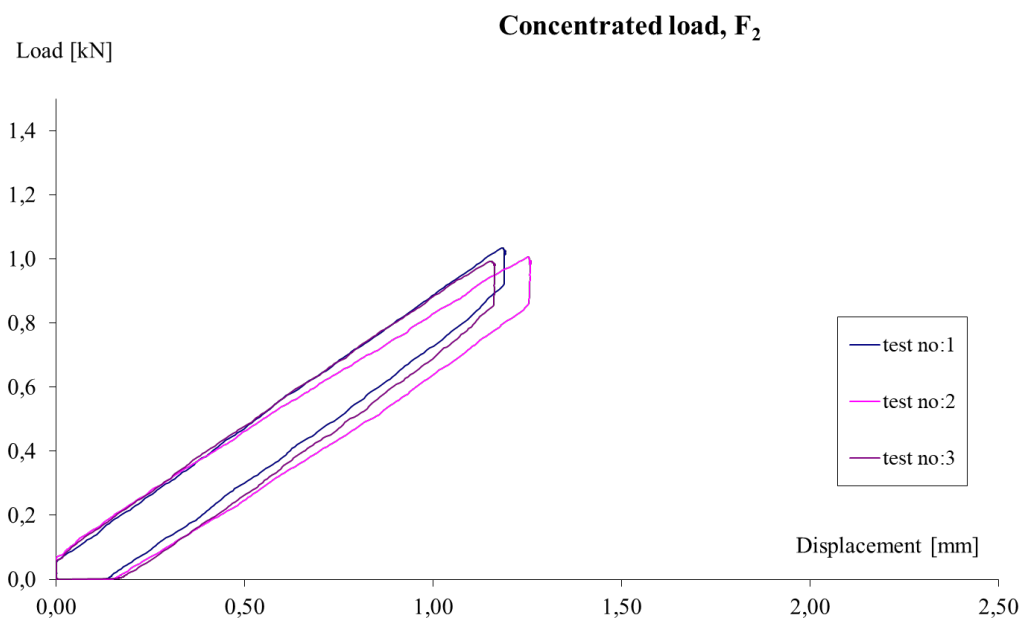


Figure A1:1 Load-displacement relationships for the three tests with concentrated load F_2 . Aluminium planks.

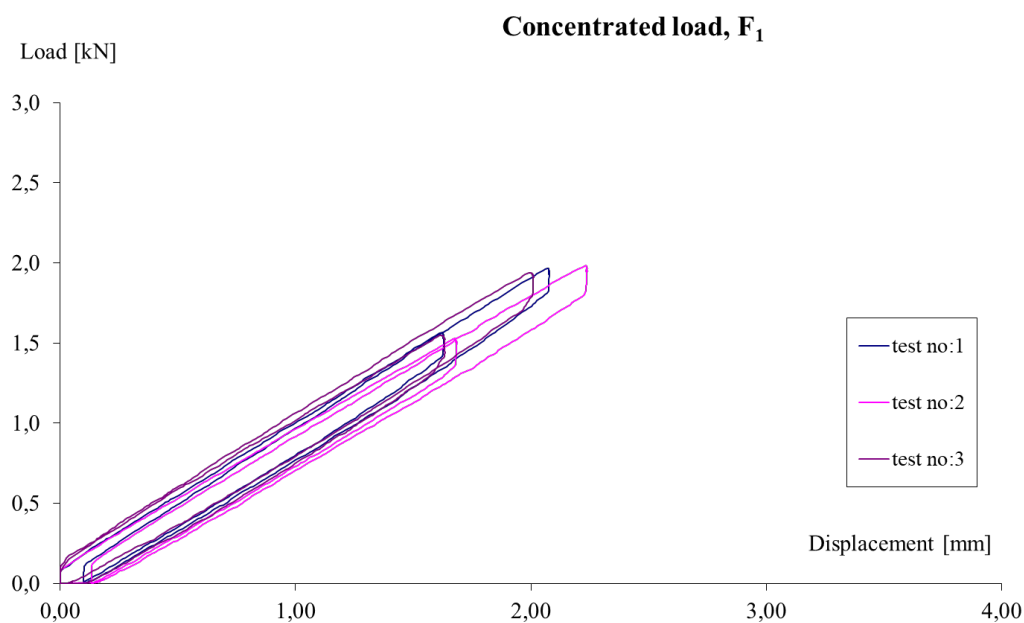


Figure A1:2 Load-displacement relationships for the three tests with concentrated load F_1 . Aluminium planks.

Appendix 1

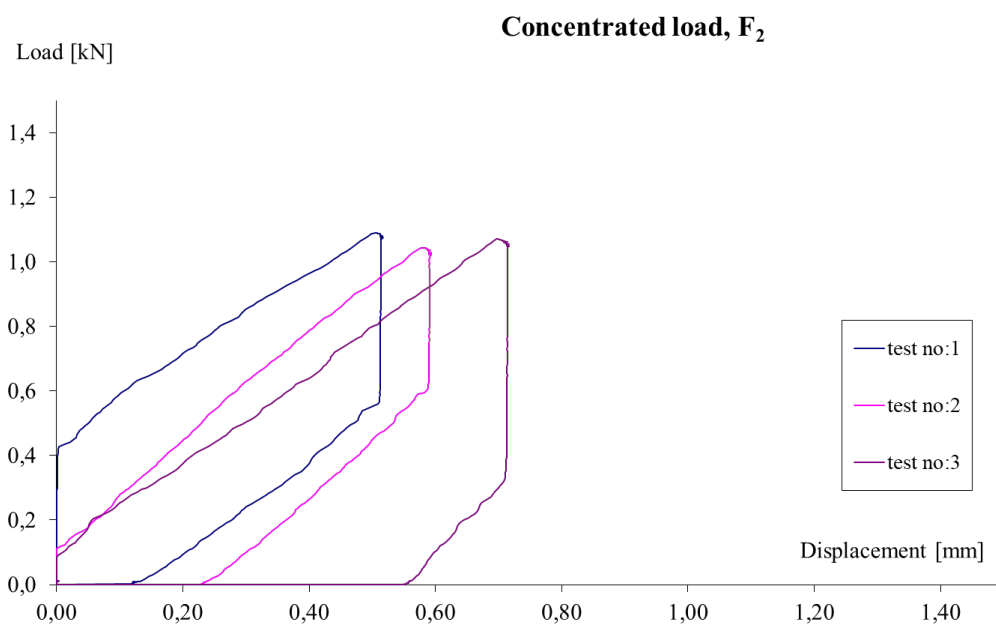


Figure A1:3 Load-displacement relationships for the three tests with concentrated load F_2 . Steel planks.

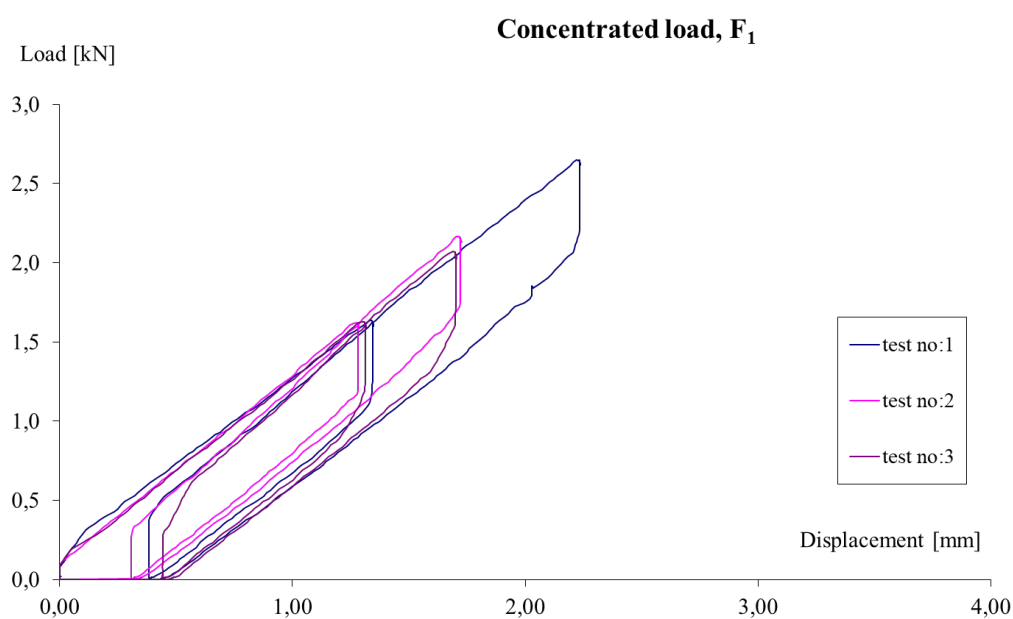


Figure A1:4 Load-displacement relationships for the three tests with concentrated load F_1 . Steel planks.