TYPE-EXAMINATION CERTIFICATE

14 55 17

HAKI Universal Aluminium S4

Holder/Manufacturer/Supplier

HAKI AB

Glimåkravägen 4, 289 72 Sibbhult

Product name

HAKI Universal Aluminium S4

Product description

As per pages 2–9 of this type-examination certificate. Technical documentation as provided to RISE, no. 3P07972, P103884.

Certificate

RISE certifies that the product specified on this type examination certificate complies with the requirements of the Swedish Work Environment Authority's Statute Book as per the provisions of AFS 1990:12 Scaffolding, 6 § (RISE certification rules SPCR 064) and SS-EN 12810-1.

Evaluated system configurations

Load class 1–5 (0.75–4.5 kN/m^2) under the conditions contained in the product description.

Marking

All components, except locks, pins etc., must be durably and permanently marked with HAKI's logotype and the year of manufacture (two digits). Aluminum planks must be marked only with the initial's PCP and the year of manufacture.

Period of validity

The type examination certificate is valid until no later than 2024-03-31.

Miscellaneous

This type-examination certificate replaces any previously issued certificates with the same number. The type-examination certificate was originally issued on 2014-03-31 by SP Sveriges Tekniska Forskningsinstitut, which in 2017 changed name to RISE Research Institutes of Sweden AB.

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This is a translation from the Swedish original document. In the event of any dispute as to the content of the document, the Swedish text shall take precedence

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Ackred. nr. 1002
Produktcertifiering
ISO/IEC 17065

Typkontrollerad
SPCR 064
enligt Arbetsmiljöverkets krav
AFS 1990:12

2019-12-09

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Product description for HAKI Universal Aluminium S4

Design

HAKI Universal Aluminium S4 modular scaffolding consists of standards, ledgers and transom beams, diagonal and horizontal braces, platforms, guardrails, etc., in accordance with the following component list. Joints between standards are made using spigots. Connections between beams and standards are made using double hooks.

Component	Designation	Item no.
Base jack	BS	2071 000
Standard S4	S4 500, 1000, 1500, 2000, 3000 AL	4017 056, -106, -156, -206, -306
Ledger beam	LB 350, 770, 1050, 1250, 1655, 1964, 2500, 3050 AL	4021 031, -073, -101, -121, -161, -191, -246, -301
Single tube beam	ERB 564, 700, 770, 1050, 1250, 1655, 1964, 2500, 3050 AL	4022 051, -066, -073, -101, -121, -161, -191,- 246, -301
Lattice beam aluminium	FB 4100, 6100, 8100 AL	4032 410, -610, -810
Lattice beam aluminium with pockets	FB 2220, 4100, 6100, 8100 AL	4032 211, -411, -611, -811
Guardrail frame	SKRD 700, 770, 1050, 1250, 1655, 1964, 2500, 3050 AL	4052 066, -073, -101, -121, -161, -191, -246, -301
Diagonal brace	DS 1250, 1655, 1964, 2500, 3050 AL	4122 120, -160, -190, -245, -300
Horizontal brace	HDS 3050x1655, 3050x1250, 2500x1250, 2500x1655 AL	4141 000, -001, -005, -006
Horizontal brace telescopic	HDS AL	4141 010
Wall tie	VST 1000–6000	7111 100–600
Wall tie brace tube	SVF 450x48 AL	4832 045
Wall tie brace tube	SVF 450x48, 600x48, 900x48, 1200x48	8832 045, -090, -120
Decking unit B=400 Decking unit B=600	1050, 1250, 1550, 1655, 1964, 2050, 2500, 2550, 3050 700, 1050, 1250, 1550, 1655, 1964, 2050, 2500, 2550, 3050	4073 102, -122, -152, -162, -192, -202, -252, -257, -302 4071 072, -102, -122, -152, -162, -192, -202, -252, -257, -302
Decking unit with hatch Decking unit with hatch + ladder	2500x600, 3050x600 AL 3050x600 AL	4071 253, -305 4071 306
Ladder	ST 2100 AL	2091 210

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Component	Designation	Item no.
Aluminium plank B=170 B=200 B=230 B=295 B=320	 ALP 1050, 1250, 1655, 2500, 3050 ALP 770, 1050, 1250, 1655, 1964, 2500, 3050 ALP 770, 1050, 1250, 1655, 1964, 2500, 3050 ALP 770, 1050, 1250, 1655, 1964, 2500, 3050 ALP 770, 1050, 1250, 1655, 1964, 2500, 3050	 2154 105, -125, -165, -250, -305 2153 079, -105, -125, -165, -195, -255, -305 2153 080, -100, -120, -160, -190, -245, -300 2153 078, -104, -124, -164, -194, -254, -304 2153 077, -103, -123, -163, -193, -253, -303
Toeboard AL	564, 700, 1050, 1250, 1655, 1964, 2500, 3050x180 AL	4161 051, -071, -105, -121, -161, -191, -251, -301
Toeboard AL with end clips	564, 700, 1050, 1250, 1655, 1964, 2500, 3050 AL	2026 050, -070, -100, -120, -160, -190, -250, -300
Toeboard wood	FL 3300x150x32	2025 331
Toeboard clip	LF 70	7161 006
Bracket	SK 230, 460 AL	4211 024, -047
Bracket with spigot	SK 564, 770 AL	4211 052, -074
Bracket diagonal	SKD 1250 AL	4211 121
Stair with landing	UTV 2500, 3050 AL	4102 247, -302
Handrail	HL 2500x2000, 3050x2000	4058 245, -300
Handrail inner UTV AL Fzv	HL inner UTV AL	7058253
Pocket coupler		2048017

Other accessories: Suspension fittings, clamps, base jack locking springs, intermediate transoms, puncheon units, pin to standard joint[2)], beam riders, lug groups, guardrail posts, cover plates, safety rails, safety roofs, transom fittings, height adjustable fittings, combination fittings, scaffold tubes, tube couplers, beam couplers.

Dimensions

Dimensions of main components are given in the table below.

Component	Dimensions
Standards	Ø48.3×4.0
ERB beams	Ø48.3×4.0
LB beams	Ø34.5×4.0
Guardrail frames	Ø34.5×4.0
Base jacks	Ø38×5

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Conditions

1. **Verified erection height** for specified **load class, bay width, bay length** (c-c distance between standards), and **lift height** with aluminium plank platforms (weight 16.5 kg/m^2) and five lifts.

Load class	4	4	3	3
Permissible load (kN/m^2)	3.0	3.0	2.0	2.0
Bay width (m)	0.7	0.77	1.05	1.25
Bay length (m)	3.05	3.05	3.05	3.05
Lift height, max. (m)	2.0	2.0	2.0	2.0
Tie spacing, max. (m)	4.0	4.0	4.0	4.0
Verified erection height (m) - without brackets - with brackets - with bridging beam	24	24	24	24

2. **Permissible standard loads** (max. load per standard) for different **lift heights, wall tie spacings** and for **fully extended** and **fully retracted base jacks**. When designing scaffolds with a different construction than above, the following **permissible standard loads** (maximum load per standard) may be used, provided that the other conditions specified under "Requirements" are observed. When designing scaffolds using the **partial coefficient method,** obtain the design load capacity by multiplying the permissible load by 1.5.

Lift height (m)	**Wall tie spacing (m)**	**Max. standard load with fully extended base jack (kN)**	**Max. standard load vertically braced with SKRD in all bays (kN)**	**Max. standard load with fully retracted base jack (kN)**
2.0	2.0	16.4	16.4	20.9
	4.0	9.5	9.5	9.8

3. Every lift must be fitted with **ledger beams** or **single tube beams** on both the inside and outside. The lowest lift must always be placed at the lowest possible level.

4. **Vertical diagonal braces** must be fitted parallel to the facade on every fifth bay and to all end bays.

5. Bays with diagonal braces must have **horizontal braces** fitted every four meters in height.

6. Calculations assume that work is only carried out on a single (1) lift.

7. The scaffolding height above is calculated on the basis that **five lifts** are fitted with platforms and/or brackets. Brackets must be fitted to the highest lifts on the erected scaffolding.

8. The scaffolding must be **anchored to the wall** at nodes between inner standards and transom beams every four metres in height. The lowest tie point must be no more than 4.7 m above the ground. Ties that can withstand horizontal forces parallel to the facade must be fitted to at least every fifth pair of standards (longitudinally) at each tie level.

9. **Wall ties** must be able to support a design pull-out or compressive load of 4.7 kN and a transverse load of 5.7 kN (V-shape tie) or 3.9 kN (standard tie). Higher wind loads can occur at heights over 24 m and this will place greater loads on the wall ties.

10. The design load on the foundation is twice the permissible load on each standard.
11. When **brackets** are used, a beam must be fitted in the gap between the main level and the bracket level, or the gap must be covered in some other way.
12. Planked lifts that are two metres or more above the ground must be fitted with **guardrails** or guardrail frames and **toeboards** on the outside and at the ends. Access points must be fitted with guardrails and toeboards at the lower end.
13. Guardrails and guardrail frames must be combined with the chosen scaffolding deck type to meet the **minimum requirement of 950 mm guardrail height**.
14. **Access** is provided by UTV stairs mounted inside a scaffolding bay or with two additional standards connected to the outside of the scaffolding with the designated components. Alternatively a stair tower can be used for access.
15. All **couplers** that are used must be type-examined.
16. The erection instructions for HAKI Universal Aluminum version 2021 were examined during the type examination.

Component load capacities

Single tube beams (ERB AL)

Load class for different section lengths across single tube beam.

Single tube beam ERB AL	Section length (platform length*) across ERB beam (mm)								
	Load class for single-sided loading (double-sided)[Note]								
Code	564	700	770	1050	1250	1655	1964	2500	3050
ERB 564 AL	6	6	6	6	6	6	6	6	6
ERB 700 AL	6	6	6	6	6	6	6	6(5)	6(5)
ERB 770 AL	6	6	6	6	6	6	6	6(5)	6(5)
ERB 1050 AL	6	6	6	6	6	6(5)	6(5)	6(4)	6(4)
ERB 1250 AL	6	6	6	6	6	6(5)	6(5)	6(4)	5(3)
ERB 1655 AL	6	6(5)	6(5)	6(5)	6(4)	5(3)	5(3)	4(3)	4(2)
ERB 1964 AL	6	6(4)	6(4)	5(3)	5(3)	4(3)	4(2)	3(-)	3(-)
ERB 2500 AL	6(5)	5(4)	5(3)	4(3)	4(3)	3(2)	3(-)	3(-)	2(-)
ERB 3050 AL	6(4)	4(3)	4(3)	3(2)	3(-)	3(-)	2(-)	-	-

* Platform weight 16.5 kg/m²

Permissible load for uniformly distributed load, point load at centre of beam (*P*), two point loads at one-third spacing (*P3+P3*) and two point loads at one-quarter spacing (*P4+P4*).

Permissible load	ERB beam AL								
	564	700	770	1050	1250	1655	1964	2500	3050
Uniformly distributed load (kN/m)	33.1	26.2	23.6	17	11.8	5.6	3.8	2.4	1.6
Point load *P* (kN)	8.5	8.5	8.5	8.5	7.1	4.5	3.7	3.0	2.4
Point loads *P3+P3* (kN)	6.4	6.4	6.4	6.4	5.3	3.4	2.8	2.3	1.8
Point loads *P4+P4* (kN)	8.5	8.5	8.5	8.5	7.1	4.5	3.7	3.0	2.4

Note Double-sided loading occurs, for example, when a ledger beam is loaded by two adjacent bays.
Single-sided loading occurs, for example, when a ledger beam is loaded by decking or some other transverse platform.

Ledger beams (LB AL)

Load class for different section lengths across ledger beam.

Ledger beam LB AL Code	Section length (platform length*) across LB AL beam (mm) Load class for single-sided loading (double-sided)[Note]							
	700	770	1050	1250	1655	1964	2500	3050
LB 350 AL	6	6	6	6	6	6	6	6
LB 770 AL	6	6	6	6	6	6	6(5)	6(5)
LB 1050 AL	6	6	6	6	6(5)	6(5)	6(4)	6(4)
LB 1250 AL	6	6	6	6	6(5)	6(5)	6(4)	6(3)
LB 1655 AL	6	6	6(5)	6(5)	6(4)	6(4)	5(3)	5(3)
LB 1964 AL	6	6	6(5)	6(5)	6(4)	6(4)	5(3)	5(3)
LB 2500 AL	6(5)	6(5)	6(4)	6(4)	5(3)	5(3)	4(3)	3(3)
LB 3050 AL	6(5)	6(5)	6(4)	5(3)	5(3)	4(3)	4(2)	3(-)

* Platform (16.5 kg/m²) supported on ledger beams LB AL

Permissible load for uniformly distributed load, point load at centre of beam (*P*), two point loads at one-third spacing (*P3+P3*) and two point loads at one-quarter spacing (*P4+P4*).

Permissible load	LB beam AL							
	350	770	1050	1250	1655	1964	2500	3050
Uniformly distributed load (kN/m	141.8	59.1	42.5	30.1	16.8	11.8	7.2	4.8
Point load *P* (kN)	42.5	30.1	21.7	18.1	13.5	11.3	8.8	7.2
Point loads *P3+P3* (kN)	21.3	21.3	16.3	13.6	10.1	8.5	6.6	5.4
Point loads *P4+P4* (kN)	21.3	21.3	21.3	18.1	13.5	11.3	8.8	7.2

Note Double-sided loading occurs, for example, when a ledger beam is loaded by two adjacent bays.
Single-sided loading occurs, for example, when a ledger beam is loaded by decking or some other transverse platform.

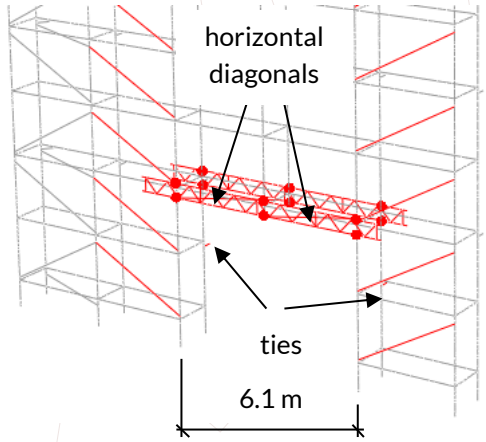
Lattice beams

Permissible load for lattice beams.

Lattice beam Type and length (mm)	Permissible load (kN/m)	Permissible distributed load (kN)	Permissible centre point load (kN)	Permissible point loading* at one-third spacing (kN)
Aluminium				
FB 4100 AL	4.9	19.4	7.5	7.5
FB 6100 AL	3.0	18.3	7.5	6.9
FB 8100 AL	1.7	13.7	6.9	5.1

* 2 point loads

The following conditions apply to erection of lattice beams



Platforms

The following load classes apply to platforms.

Platform	Width (mm)	Length (mm)	Load class
Decking unit	400 and 600	1050–3050	3
Aluminium plank	170–230	1050–2050	6
		3050	5
	295–320	1050–2050	6
		2500	5
		3050	4

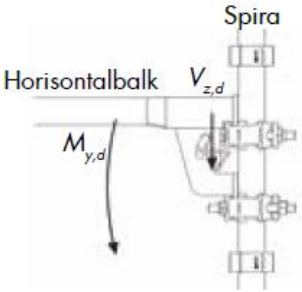
Brackets

The following load classes apply when brackets are used.

Bracket	Load class for bay length 3.05 m*
SK 230AL	6
SK 460 AL	4
SK 564 AL	3
SK 770 AL	
SK 1250 AL	

* For planks with a weight of 16.5 kg/m^2

Pocket coupler



Load	Maximum load
My	1337 Nm
Vz, one coupler (double couplers)	7.5 kN (14.9 kN)

Erection instructions

Erection instructions must be supplied with the scaffolding when it is handed over to the user.

Miscellaneous

This type examination certificate is valid for scaffolding made and supplied by the manufacturer and supplier as stated on the type examination certificate, using materials, dimensions and designs that match those of the examined material.

The scaffolding must not be assembled using components from another type of scaffolding unless a special investigation of the resulting load-carrying capacity has been carried out.