



RINGSCAFF

MODULAR SCAFFOLDING

INSTRUCTIONS FOR
ASSEMBLY AND USE
(AVA) - V20.1

**SMART
DETAILS
GREAT
SOLUTIONS!**



RINGSCAFF





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1 INTRODUCTION

The RINGSCAFF system by scafom-rux is a modular scaffolding system that combines the assembly speed of a system scaffolding with the flexibility of a traditional scaffolding system, resulting in the following advantages:



SAFETY

TIME SAVING

QUALITY

The RINGSCAFF system consists of modular components such as vertical standards, horizontal tubular ledgers and intermediate ledgers as well as vertical diagonals which can be connected in various positions with a fixed perforated ring. All modular components have been developed and tested in accordance with European standards.

EN12810: Façade scaffolds made of prefabricated components -
Part 1: Product specifications

EN12810: Façade scaffolds made of prefabricated components –
Part 2: Particular calculation procedures and verification

EN12811: Temporary structures for buildings -
Part 1: Working scaffolds - performance requirements, design, construction
and calculation

EN12811: Temporary structures for buildings - Part 2: Information on materials

EN12811: Temporary structures for buildings - Part 3: Tests on load-bearing capability

This system can also be used to erect safe working platforms for all load classes from 1 to 6 – up to 600 kg/m² – in accordance with EN12811.

To protect the system against corrosion and to ensure a long service life, all components have been hot-galvanised as per EN ISO 1461 or equivalent criteria.

The RINGSCAFF system is used all over the world and is approved for use in many different countries. In Europe it has official approval from the German Institute for Building Technology: DIBT (French institute): AFNOR (Swedish institute): SP and AENOR (Spanish institute).

Moreover, in addition, the system, its components and parts have been tested, verified and approved according to various other standards such as for Australia and New Zealand e.g. AS/NZS 1576.1 and 1576.3 as confirmed by the CertMark certification CMA-TT10018REV1.

This manual has been prepared for persons who assemble and work with the RINGSCAFF system. It serves as an aid for the safe and efficient erection of the standard, basic scaffolding configurations. Please contact your technical service department or your dealer for further information on non-standard use or more complex structures.

This manual describes various components, including their use and safe working loads. It mainly contains instructions pertaining to façade scaffolds with nominal widths of 0.732 m (2 steel decks), 1.088 m (3 steel decks) and 1.400 m (4 steel decks). The instructions in this manual can also be used for guidance on the use of “metric” bay lengths and widths.



1.1 PRELIMINARY CONSIDERATIONS

The erection, modification and dismantling of the RINGSCAFF scaffolding system should only be carried out by competent persons who know the system or under such person's supervision.

Damaged components may not be used to erect a system scaffolding. During the erection of the scaffold, a visual inspection of the condition of the parts needs to be carried out. If parts look worn or damaged, they should not be used but returned to the depot for repair or replacement.

The information in this manual refers specifically to the component elements of the modular scaffolding system “RINGSCAFF 2005”, the production of which started in 2005.

In recent years there have been considerable improvements in the scaffolding industry, meaning e.g. that a scaffold structure may contain components from different origins/manufacturers. The scafom-rux company follows the principle that this is only permissible when each component used is a part of a certified scaffolding system. Further, mixing approvals are available in some cases. They fundamentally describe which components may be used. This applies both to “original approvals” as well as for “mixing approvals”. Currently, there are no basic legal uncertainties regarding mixing approvals. This manual also covers “mixed scaffolds”. It is adapted to reflect the features and standard configurations for mixing with Layher Allround and Plettac Contur/Futuro.

The stability of the scaffolding at the construction site is ensured when the scaffold builder follows the regulations pursuant to the scaffold approval certification and the associated requirements contained in these Instructions for Assembly and Use. The risk of a “site closure” or liability in case of accidents exists for both unmixed as well as mixed scaffolds.

All scaffold structures on the construction site are to be erected in accordance with valid technical requirements, approvals and in line with the prevailing Industrial Safety Regulation.

1.2 DESIGNATIONS AND FUNDAMENTAL COMMENTS

- 1.2.1 The designation of the RINGSCHAFF access, working and protective scaffolding system as prescribed in EN12810-1 is (according to German approval Z-8.22-869): Scaffolding EN 12810 - 3D - SW06/307 - H2 - A - LA.
- 1.2.2 This specific designation refers to the standard configurations described later in this manual, representing the basis for the RINGSCHAFF approval Z-8.22-869. Deviations from these standard configurations are possible and permissible when – in a specific case – the stability and suitability for use pursuant to the technical regulations and/or building codes and the data and instructions contained in this manual have been verified in writing.
- 1.2.3 Stability and functional suitability can also be verified on the basis of the planning tables contained in this manual, which have been prepared in accordance with the technical building regulations.
- 1.2.4 Deviations from the alternatives detailed in this manual are possible if the safety of the erection and dismantling procedures (e.g. fall protection, stability in intermediate stages) has been tested and proven in individual cases.
- 1.2.5 Work in connection with the erection, modification and dismantling of scaffolds may only be carried out by qualified, trained and suitable scaffold erectors with relevant approval and under the supervision of a qualified person (supervisor) on the basis of a project-related risk assessment and risk analysis (and the assembly instructions).
- 1.2.6 The supervisor and the scaffolders need to be able to access this manual and the product approval on the construction site during erection and dismantling of RINGSCHAFF scaffolds.
- 1.2.7 Scaffolding may only be erected or dismantled up to wind force 5 on the Beaufort scale. In stronger winds, the scaffold must be secured immediately, and clearance is recommended. **Note:** when wind forces above 6 prevail, simple walking movement through the wind is only possible with noticeable restrictions and hindrances.
- 1.2.8 For the assembly of the scaffold on site, the scaffolding company will – depending on the complexity – need to provide a plan as well as a drawing and have it prepared by a qualified person. For this purpose, this manual can be used supplemented with details for each scaffolding version.
- 1.2.9 Unfinished scaffolds or scaffold areas must be marked with the prohibition sign “Access prohibited to unauthorized persons”. Access to these hazardous zones must be clearly cordoned off.
- 1.2.10 After completion, the respective scaffolders need to check the scaffold for proper assembly and safe function before it is handed over to the user. Inspection and verification will need to be carried out by a person qualified for this purpose - if necessary by the project supervisor or site manager.

- 1.2.11 After completion and inspection, the scaffolding has to be marked for handover. This scaffold marking (e.g. with the scafom-rux Scaffold-Tag) is to contain information about the scaffolding company, type, load and width class. General instructions and information should also be included. The tag is attached to the scaffolding in a clearly visible position e.g. next to the access points.
- 1.2.12 Once the scaffolding has been checked by the scaffolding erector to ensure that it is in proper condition, it can be handed over to the user. It is recommended to carry out the handover and final inspection together with the user and to record this in a checklist or report. The results of the inspection and handover are to be documented in the checklist form or report and are to be kept for a reasonable period of time, usually three months longer than the standing time of the scaffolding.
- 1.2.13 This manual has to be available to users throughout the entire service life of the scaffolding.

1.3 PRELIMINARY REMARKS BEFORE SCAFFOLD ASSEMBLY

- 1.3.1 These Instructions for Assembly and Use apply to the erection, modification and dismantling of the RINGSCAFF modular scaffolding system as well as to its use, exclusively by professionals.
- 1.3.2 The RINGSCAFF scaffolding system has, among others, the German approval DIBt No. Z-8.22-869 (general and official approval).
- 1.3.3 The standard configurations described in this manual correspond to the approval No. Z-8.22-869. They are detailed in Appendix I of this manual; additional information can be derived from the German approval mentioned above. Please contact your technical service department or your dealer for further information on non-standard use or more complex structures.
- 1.3.4 The technical solutions described in this manual shall not be deemed as excluding any other proven solutions for which at least adequate evidence has been provided that they are equivalent alternatives.
- 1.3.5 In addition to the provisions in this manual and the general regulations, both the scaffolders and the users of the scaffolds are obliged to follow the general, valid rules and requirements regarding scaffolds and safety, such as e.g.:
- General type approval - German Institute for Building Technology DIBt No. Z-8.22-869.
 - EN12810: Façade scaffolds made of prefabricated components
 - EN 12811: Temporary structures for buildings
 - DIN 4420-1: Working and protective scaffolds - Part 1: Protective scaffolds
 - (Inter)national provisions on labour law and occupational health and safety
 - Industrial safety regulations for the industrial sector in their latest version
 - Accident prevention regulations
 - Technical regulations on operational safety
 - Guidelines and technical regulations for working and protective scaffolds, birdcage scaffolds and free-standing scaffolds
 - Guidelines for the erection and dismantling of scaffolding

- 1.3.6 These instructions are only valid when original RINGSCAFF components are used; marked with "Ü" in accordance with approval Z-8.22-869 and the parts list in Appendix I.
- 1.3.7 The RINGSCAFF components may not be changed or modified.
- 1.3.8 Before the components are fitted, they must be checked by the scaffolder / scaffold supplier. Damaged components may not be used to assemble a system scaffold. A visual inspection of the condition of the parts is to be carried out during the erection of the scaffold. If parts look worn or damaged, they should not be used but returned to the depot for repair or replacement.
- 1.3.9 The employers of RINGSCAFF scaffolding workers are obliged to carry out inspections of these scaffolding activities and work at height. Workers who do not meet the screening requirements for work at height (e.g. hazardous conditions) may not be permitted to access the scaffold.
- 1.3.10 The publisher of these Instructions for Assembly and Use is scafom-rux Holding and its subsidiaries; email: info@scafom-rux.com.

Subject to technical modifications and revision.

In the event of any open issues or missing instructions, the current national rules and regulations always need to be consulted.

1.4 WARNINGS BEFORE ASSEMBLY AND USE

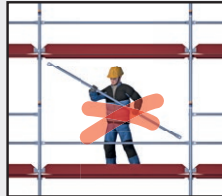


WARNINGS

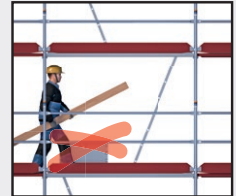
- **Unauthorised access and use of the scaffolding is forbidden.**
- **Any defects or deficiencies are to be reported to the scaffold builder immediately and the scaffold is to be cordoned off and made inaccessible.**



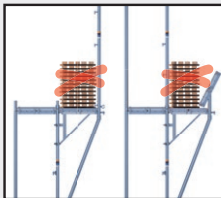
Pay careful attention to the Safety Instructions



Any modifications to the scaffolding may only be carried out by the scaffold builder



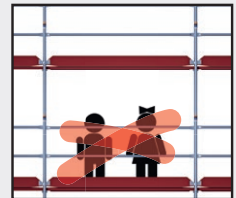
Keep hatches in the ascent decks closed



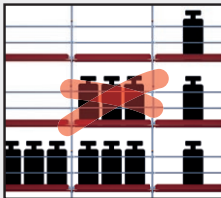
Do not store material on safety catch scaffolds or protective roofs



Workplaces may not be located above one another at any one time



Children may not access the scaffolding at any time



Do not overload scaffold decks



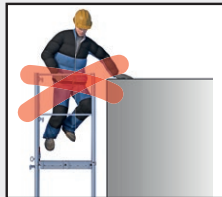
Pay careful attention to any possible risk of falling between the scaffold and the building



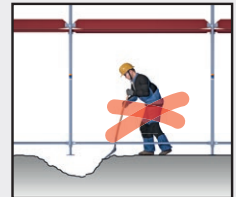
Only use fitted ladders or stairways for ascent and descent



When material is stored, make sure there is still sufficient space left to move along the decking



Do not jump on decks



Do not endanger the stability of the scaffolding by excavating or digging around the base

2 THE RINGSCAFF MODULAR CONNECTION

The connection of the various RINGSCAFF components to the standards is achieved with a specially designed perforated ring that is welded to the vertical standards at 0.50 m intervals to each other. The wedge head connectors on the RINGSCAFF tubular ledgers enable simple attachment to the perforated ring.

The flat perforated ring has four narrow holes and four large holes, see Figure 2.1.

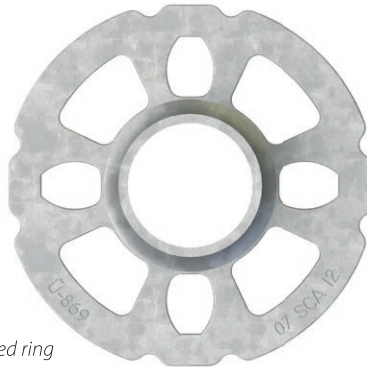


Figure 2.1: RINGSCAFF perforated ring

The four narrow holes position the tubular ledgers automatically and affix them at right angles immediately after being secured by means of the wedge.

The four large holes allow the tubular ledgers and diagonals to be aligned at the required angle, as shown in Figure 2.2.

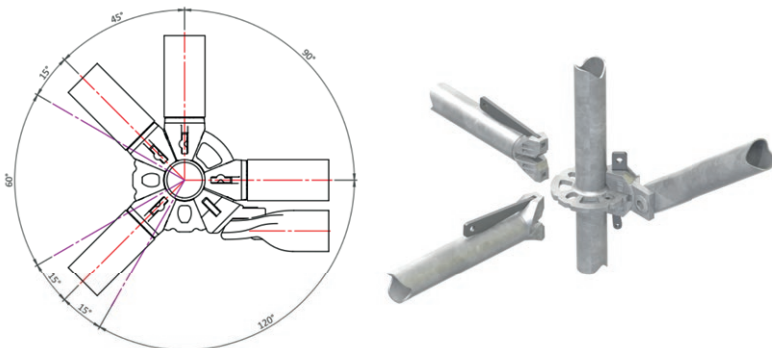


Figure 2.2: Plan view of RINGSCAFF node

The connection is made by (see figures 2.3):

- a) Sliding the ledger head over the flat perforated ring
- b) Inserting the wedge into one of the holes
- c) Securing the wedge with a blow with a metal hammer (500 g) until the impact rebounds



Figure 2.3a

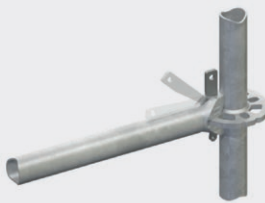


Figure 2.3b



Figure 2.3c

The connection has thereby been transformed into a force-transmitting, rigid one that can immediately absorb loads in any direction, see Figure 2.4.

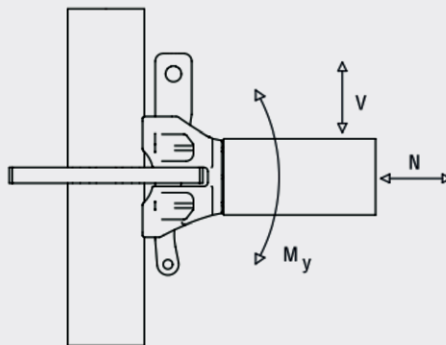


Figure 2.4: Fixed node

3 LOAD-BEARING CAPACITY OF THE RINGSCAFF NODE

The strength, stiffness and stability of the scaffold structure is determined by the rigidity of the RINGSCAFF node and the load-bearing capacity of several RINGSCAFF components.

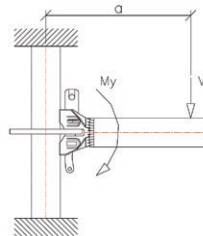
In this and the following sections, the stiffness of the node as well as the load-bearing capacity of supporting components such as the RINGSCAFF base jack, the standards, tubular ledgers, diagonals and steel decks are described in more detail. These loads are calculated for the "RINGSCAFF 2005 system" and have been determined by means of tests and static calculations (in accordance with e.g. AS/NZS1576.1, AS/NZS1576.3, EN12810 and EN12811).

All loads mentioned are "safe working loads" or "permissible loads." These loads are defined as rated loads (characteristic strength as determined by statistically evaluated test results) divided by the specified load factor (1.5).

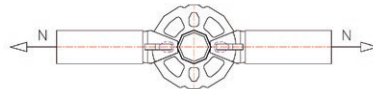
In addition, please consult the technical approval Z-8.22-869 for values regarding load assumptions and design loads as well as for the control calculations for the node.

3.1 RINGSCAFF node (permissible loads)

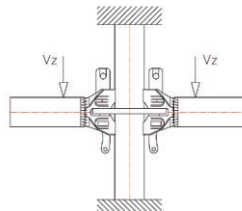
Bending moment at tubular ledger connection: $M_y = V * a$
max $M_y = +/- 80,0 \text{ kNcm}$



Normal force at tubular ledger connection:
max $N = +/- 25,7 \text{ kN}$

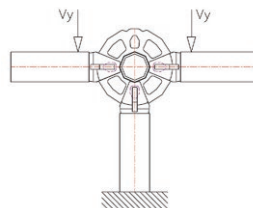


Vertical load on tubular ledger to perforated ring:
max $V_z = +/- 20,5 \text{ kN}$

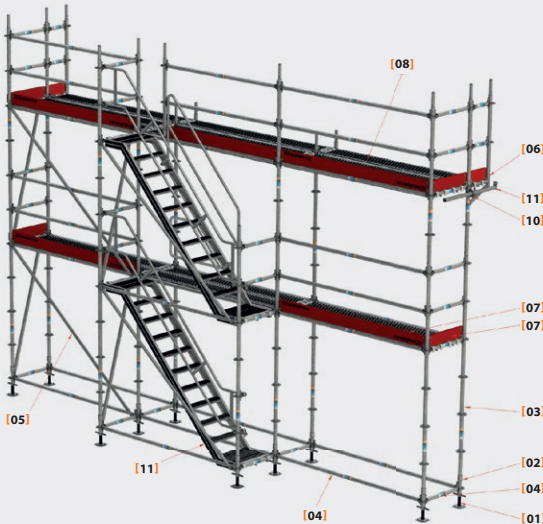


Note: according to Z-8.22-869; max. $\sum V_z = 72,0 \text{ kN}$

Horizontal load on tubular ledger to perforated ring:
max $V_y = +/- 10,6 \text{ kN}$



4 RINGSCAFF BASIC COMPONENTS



RINGSCAFF offers a complete scaffolding solution with the following main components:

- [01]** Base jack 4.1
- [02]** Standard lead-off adapter 4.2
- [03]** Standard 4.3
- [04]** Tubular ledger/Intermediate ledger 4.4
- [05]** Vertical stabilisation 4.5
- [06]** Side bracket 4.6
- [07]** Side protection 4.7
- [08]** Platform 4.8
- [09]** Anchor 4.9
- [10]** Accessories 4.10
- [11]** Access 4.11

Figure 4.1: Example of a scaffold structure

4.1 Base jack

The adjustable, threaded base jack is used to level-off the scaffolding standards at the same height. (other base jack lengths on request).



Product number	Description	Weight (kg)
E02RS0005	Base jack 0.60 m	4.0
E02RS0002	Base jack 0.78m	4.8

Permissible load for base jack, 60 cm (centric load = 0 % of vertical load)	
Spindle length (mm)	≤450
Permissible load (kN)	30

Permissible load for base jack, 60 cm (in combination with horizontal load = 5 % of the vertical transverse force)				
Spindle length (mm)	100	200	300	400
Permissible load (kN)	52	42	33	25

4.2 Standard lead-off adapter

The standard lead-off adapter with a simple perforated ring is placed over the base jack and enables the erection of a simple base structure from the scaffolding.



Product number	Description	Weight (kg)
E04RS0002	Standard lead-off adapter 0,26 m	1.5
Optional	Standard lead-off adapter 0.43m	2.5

4.3 Standard

The vertical standard carries the loads from the scaffold down to the ground. The standard tube with an outer diameter of 48.3 mm has perforated rings at 0.5 m intervals, a press-fit tube connector at the top and drill holes at both ends.



Product number	Description	Weight (kg)
Optional	Standard with tube connector 0.5 m	3.0
E04RS0030	Standard with tube connector 1.0m	5.4
E04RS0055	Standard with tube connector 1.5m	7.7
E04RS0071	Standard with tube connector 2.0m	10.0
optional	Standard with tube connector 2.5m	12.4
E04RS0096	Standard with tube connector 3.0m	14.8
E04RS0107	Standard with tube connector 4.0m	20.2

Permissible centric vertical load for standards (reinforcement in two directions)

Reinforcement in (m)	1.5	2.0	2.5
Max. centric load (kN)	42.2	28.1	19.3

Note:

The above-mentioned load-bearing capacity values for standards are merely indicated values. According to EU guidelines, the vertical load-bearing capacity for standards depends on several other factors such as:

- Lifting height of the platforms
- Influence of horizontal loads
- Reinforcement and scaffold anchorage arrangement

To assess the exact load-bearing capacity of the standards, please contact your design engineering consultants.

The standards are manufactured with a press-fit tube connector. These standards may not be used for suspended structures. For suspended standards, please contact your local scaffolding supplier.

4.4 Tubular ledger / Intermediate ledger

The tubular ledger consists of a 48.3 mm diameter tube with wedge-shaped end pieces at both ends. The tubular ledger is used in various lengths as a support for steel decks or wooden scaffold planks or as a structural element. The tubular ledger is also used as a guardrail or knee rail for side protection.

The tubular ledger may also serve as an intermediate ledger, taking the form of a U-shaped tubular ledger.



Product number	Description	Weight (kg)
E04RS0011	Tubular ledger 0.73 m	3.0
E04RS0033	Tubular ledger 1.09m	5.4
E04RS0047	Tubular ledger 1.40m	7.7
E04RS0058	Tubular ledger 1.57m	10.0
E04RS0074	Tubular ledger 2.07m	12.4
E04RS0086	Tubular ledger 2.57m	14.8
E04RS0099	Tubular ledger 3.07m	20.2

Load-bearing capacity of the tubular ledgers
(more detailed table, in combination with various platform arrangements, available on request)

Bay length (m)	0.73	1.09	1.40	1.57	2.07	2.57	3.07
Line load (kN/m)	21.8	10.5	6.7	5.4	3.3	2.2	1.6
Point load in the middle (kN)	7.8	5.5	4.4	4.0	3.2	2.6	2.3



Product number	Description	Weight (kg)
E04RS0232	Double ledger 1.57 m	3.0
E04RS0233	Double ledger 2.07m	5.4
E04RS0234	Double ledger 2.57m	7.7
E04RS0235	Double ledger 3.07m	10.0

Load-bearing capacity of the double tubular ledgers

Bay length (m)	1.57	2.07	2.57	3.07
Line load (kN/m)	17.5	12.3	7.9	5.8
Point load in the middle (kN)	13.9	11.6	9.3	7.5



Product number	Description	Weight (kg)
E04RS0651	Reinforced ledger T 1.09 m	7.4
E04RS0653	Reinforced ledger T 1.40m	9.7

Load-bearing capacity of the reinforced tubular ledgers T

Bay length (m)	1.09	1.40
Line load (kN/m)	18.5	11.2
Point load in the middle (kN)	9.9	7.8

The intermediate ledger reduces the free space in a scaffold bay that needs to be covered with wooden scaffold planks. A wedge fixes the position of the intermediate ledger.



Product number	Description	Weight (kg)
E04RS0020	Intermediate ledger 0.73 m	3.6
E04RS0039	Intermediate ledger 1.09m	5.3
E04RS0053	Intermediate ledger 1.40m	6.4
E04RS0067	Intermediate ledger 1.57m	7.2
E04RS0202	Intermediate ledger 2.07m	8.3
E04RS0236	Intermediate ledger 2.57m	10.1
E04RS0237	Intermediate ledger 3.07m	12.1

Load-bearing capacity of the intermediate tube ledgers							
Bay length (m)	0.73	1.09	1.40	1.57	2.07	2.57	3.07
Line load (kN/m)	17.3	7.8	4.7	3.7	2.1	1.0	0.6

4.5 Vertical stabilisation

The vertical reinforcement consists of a 48.3 mm diameter tube with wedge connectors at both ends. The vertical reinforcement increases the rigidity of the scaffold structure.



Product number	Description	Weight (kg)
E04RS0005	Vertical reinforcement 0.73 x 2.0 m	7.2
E04RS0030	Vertical reinforcement 1.09 x 2.0 m	7.5
E04RS0055	Vertical reinforcement 1.40 x 2.0 m	7.9
E04RS0071	Vertical reinforcement 1.57 x 2.0 m	8.1
E04RS0225	Vertical reinforcement 2.07 x 2.0 m	9.0
E04RS0096	Vertical reinforcement 2.57 x 2.0 m	10.0
E04RS0107	Vertical reinforcement 3.07 x 2.0 m	11.0

Load-bearing capacity of the vertical diagonals (2.0 m lift)							
Bay length (m)	0.73	1.09	1.40	1.57	2.07	2.57	3.07
Max. compression load (kN)	-12.2	-11.3	-10.5	-9.9	-8.3	-6.8	-5.6
Max. tensile load (kN)	+13.0	+13.0	+13.0	+13.0	+13.0	+13.0	+13.0

4.6 side bracket

The side brackets can be used to enlarge the working platform. This extension can be made with either a single-deck bracket (0.39 m), a two-deck bracket (0.73 m) or a three-deck bracket (1.09 m).



Product number	Description	Weight (kg)
E04RS0543	Bracket 0.39 m (tube)	3.8
E04RS0018	Bracket 0.73m (tube)	6.8
E04RS0270	Bracket 1.09m (tube)	11.5

The RINGSCAFF side brackets are designed for a maximum load-bearing capacity of 1.5 kN/m² on the extended platform.

Load-bearing capacity of the side brackets			
Bracket length (m)	0.39	0.73	1.09
Line load (kN/m)	4.6	4.6	4.6
Point load in the middle (kN)	1.5	1.5	1.5

4.7 Side protection

The toe boards made of wood or steel limit each scaffolding level and prevent material from falling down.



Product number	Description	Weight (kg)
E04RS0016	Wooden toe board 0.73m	2.8
E04RS0037	Wooden toe board 1.09m	3.9
E04RS0054	Wooden toe board 1.40m	4.9
E04RS0064	Wooden toe board 1.57m	5.5
E04RS0076	Wooden toe board 2.07m	7.2
E04RS0091	Wooden toe board 2.57m	8.8
E04RS0101	Wooden toe board 3.07m	10.3



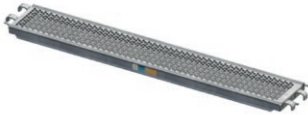
Product number	Description	Weight (kg)
E04RS0631	Steel toe board 0.73m	2.4
E04RS0632	Steel toe board 1.09m	3.4
E04RS0633	Steel toe board 1.40m	4.3
E04RS0634	Steel toe board 1.57m	4.7
E04RS0635	Steel toe board 2.07m	6.1
E04RS0636	Steel toe board 2.57m	7.5
E04RS0637	Steel toe board 3,07m	8.7

4.8 Platforms / Scaffold system deckse

The steel decks are used to build platforms. They are made of light sheet steel with a non-slip surface. The steel decks are placed on the intermediate ledgers.

Various steel decks are available in widths of 0.32 m and 0.19 m for fitting on intermediate tubular ledgers or on U-shaped intermediate ledgers. The load-bearing capacity of the decks is determined by the classification 1 to 6 in accordance with EN 12811-1. The load-bearing capacities of these classes are:

Class	Load [in kN/m ²]
1	0.75
2	1.5
3	2.0
4	3.0
5	4.5
6	6.0



Product number	Description	Weight (kg)
E04RS0021	Steel deck 0.32 x 0.73 m	4.8
E04RS0040	Steel deck 0.32 x 1.09 m	10.4
E04RS0273	Steel deck 0.32 x 1.40 m	12.2
E04RS0063	Steel deck 0.32 x 1.57 m	13.6
E04RS0075	Steel deck 0.32 x 2.07 m	17.2
E04RS0090	Steel deck 0.32 x 2.57 m	20.5
E04RS0100	Steel deck 0.32 x 3.07 m	23.8

Load-bearing capacity of steel decks, width = 0.32 m (according to scaffold classification EN 12811-1)

Bay length (m)	0.73	1.09	1.40	1.57	2.07	2.57	3.07
Scaffolding class	6	6	6	6	6	5	4



Product number	Description	Weight (kg)
E04RS0419	Steel deck 0.19 x 0.73 m	4.8
E04RS0420	Steel deck 0.19 x 1.09 m	7.2
E04RS0421	Steel deck 0.19 x 1.40 m	9.2
E04RS0422	Steel deck 0.19 x 1.57 m	10.3
E04RS0423	Steel deck 0.19 x 2.07 m	13.6
E04RS0424	Steel deck 0.19 x 2.57 m	16.9
E04RS0425	Steel deck 0.19 x 3.07 m	20.2

Load-bearing capacity of steel decks, width = 0.19m (according to scaffold classification EN 12811-1)

Bay length (m)	0.73	1.09	1.40	1.57	2.07	2.57	3.07
Scaffolding class	6	6	6	6	6	5	4

4.9 Scaffold anchor

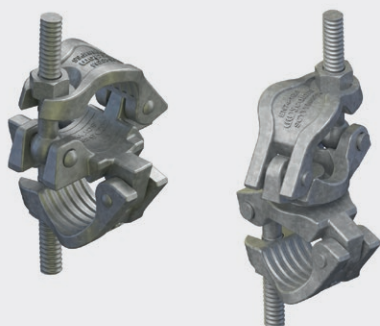
In order to obtain a stable construction, the façade scaffolding needs to be anchored to a building. Together with a connecting eyelet on the building and the vertical couplers, the anchors connect the scaffold to the building and transfer the horizontal loads from the scaffold to the building.



Product number	Description	Weight (kg)
E04AA0005	Anchoring tube 0.35 m	1.8
E04AA0006	Anchoring tube 0.90m	3.8
E04AA0004	Anchoring tube 1.00m	4.2
E04AA0007	Anchoring tube 1.50m	6.1
E04AA0029	Anchoring tube 1.60m	6.5
E04AA0030	Anchoring tube 2.00m	8.0
E04AA0046	Anchoring tube 2.40m	9.5

4.10 Accessories / Couplers

Couplers are used to connect two scaffold tubes (diameter 48.3 mm) e.g. to connect the anchoring tube to the vertical tube. Couplers can be rectangular couplers or swivel couplers, both with wedge or bolt-nut connection (as per EN74).



Product number	Description	Weight (kg)
Various	Rectangular coupler (standard coupler) Class BB SW19/22	1.3
Various	Swivel coupler Class B SW19/22	1.4

4.11 Access

Ladder frames are used for scaffolding with a low gradient or when access by workers with equipment is not required.



Product number	Description	Weight (kg)
E04RS0465	Ladder frame aluminium/plywood 0.61 x 2.57 m	21.0
E04RS0466	Ladder frame aluminium/plywood 0.61 x 3.07 m	24.5

**Load-bearing capacity of an aluminium ladder frame, width = 0.61 m
(as per scaffold classification EN 12811-1)**

Bay length (m)	2.57	3.07
Scaffolding class	3	3



Stairway access is recommended for ascent to higher platforms. The stairs are made of aluminium and can be easily handled by two persons.

Product number	Description	Weight (kg)
E04RS0571	Aluminium platform stairway 2.57 x 2.00 m	31.0

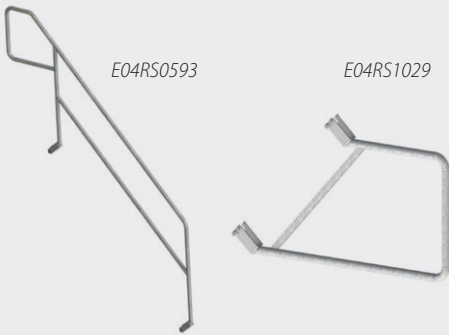


The outer and inner handrails guide you safely to the higher levels of the scaffolding. Both handrails are made of steel.

Product number	Description	Weight (kg)
E04RS0572	Outer handrail 2.57 x 2.00 m	13.8
E04RS0573	Inner handrail 2.57 x 2.00 m	10.9
E04RS0593	Inner handrail, extended	12.2



Product number	Description	Weight (kg)
E04RS0592	Railing holder	1.0
E04RS1029	Guardrail universal	5.7



4.12 Lattice girders

Lattice girders are used to carry heavy loads with a large span width or to erect a bridge structure within the scaffolding.

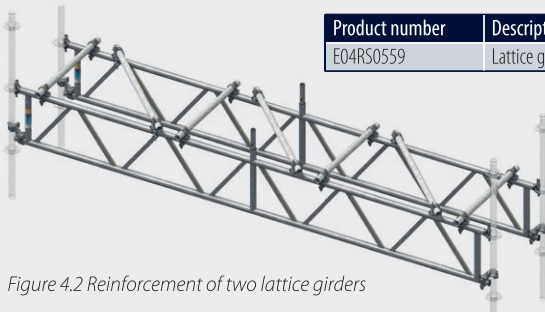


Product number	Description	Weight (kg)
E04RS0240	Lattice girder + tube connector 4.14 m	43.3
E04RS0241	Lattice girder + tube connector 5.14m	52.6
E04RS0242	Lattice girder + tube connector 6.14m	62.8

The intended load-bearing capacity of the lattice girders can only be achieved by reinforcing the top chord of the lattice girder every 1.2 m. See figure 4.2.

Load-bearing capacity of the lattice girders (reinforcement on the top chord of the lattice girder every 1.2 m)

Length of lattice girder (m)	4.14	5.14	6.14
Point load in the middle (kN)	21.5	19.8	18.3



Product number	Description	Weight (kg)
E04RS0559	Lattice girder coupler	1.6

Figure 4.2 Reinforcement of two lattice girders

The full list of RINGSCAFF products on offer varies from region to region. Please contact your local distributor for a complete product list.

5 ASSEMBLY AND LOAD-BEARING CAPACITY OF WORKING PLATFORMS / SYSTEM DECKS

Working platforms consist of a platform out of steel decks or wooden planks and a side protection. This side protection consists of a principal guardrail, a knee rail and a toe board.

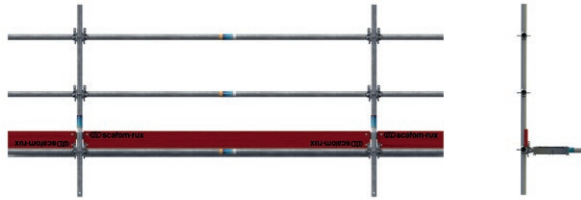


Figure 5.1: Side protection

According to the European standard for façade scaffolds (EN 12811-1), the following minimum widths are required for working platforms:

- Class W06: minimum width = 0.60 m, e.g. RINGSCAFF: 0.73m
- Class W09: minimum width = 0.90m, e.g. RINGSCAFF: 1.09m
- Class W12: minimum width = 1.20m, e.g. RINGSCAFF: 1.40m

In all cases, the free space available on scaffolds has to be at least 500 mm.

This section describes how working platforms are assembled with the standard RINGSCAFF steel decks and wooden planks together with intermediate ledgers.

The load-bearing capacity of a platform depends on how the load is transferred from the platform via the intermediate ledgers to the standards. It makes an important difference to the load-bearing capacity whether the platforms are fitted with steel decks or with wooden planks together with intermediate ledgers.

In all cases, the scaffold reference value has to be marked in accordance with the six load classes pursuant to Table 3 of EN12811-1:

Table 3 - Traffic loads in working areas (see also 6.2.2)

Load class	Evenly distributed load	Concentrated load in the range 500 mm x 500 mm	Concentrated load in the range 220 mm x 200 mm	Partial area load	
	q_1 kN/m ²	F_1 kN	F_2 kN	q_2 kN/m ²	Partial area factor a_p ¹
1	0.75	1.50	1.00
2	1.50	1.50	1.00
3	2.00	1.50	1.00
4	3.00	3.00	1.00	5.00	0.4
5	4.50	3.00	1.00	7.50	0.4
6	6.00	3.00	1.00	10.00	0.5

5.2 Steel decks

RINGSKAFF steel decks have a non-slip surface and are equipped with welded clamps at the head sections for intermediate ledgers. The decks have an anti-lift retainer at both ends, which needs to be attached during erection to prevent the steel deck from lifting unintentionally or due to wind load. See figure 5.2.



Figure 5.2: Securing the steel decks against lift

Standard steel decks are 0.32m or 0.19m wide. The following arrangements are possible for the various platform widths:

Arrangement of the steel decks							
Bay length (m)	0.73	1.09	1.40	1.57	2.07	2.57	3.07
No. decks:	2 x 0.32	3 x 0.32	4 x 0.32	4 x 0.32 1 x 0.19	6 x 0.32	7 x 0.32 1 x 0.19	9 x 0.32

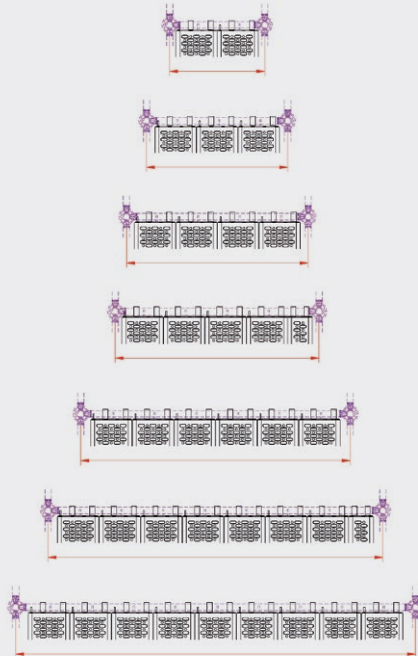


Figure 5.3: Arrangement of the steel decks



Load-bearing capacity of working platforms with steel decks

In the case of steel decks, the load is transferred from the working platform through the steel decks to the intermediate ledgers. This means that the load-bearing capacity is determined by the maximum load-bearing capacity of the steel deck or the maximum load-bearing capacity of the intermediate ledger or the supporting structure. There can essentially only be two different platform configurations for façade scaffold structures.

- A) single bay, like a tower
- B) Several bays, like a façade

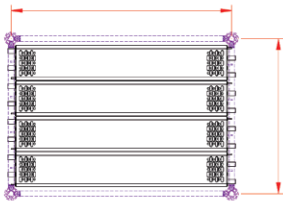


Figure 5.4: A) Single-bay structure

In configuration A, the entire platform load is distributed evenly over two intermediate ledgers.

In configuration B, this load is distributed over only one intermediate ledger.

In the following table the maximum platform loads are indicated in accordance with the scaffold class as per EN 12811-1:
Assumption: individual intermediate tubular ledgers.

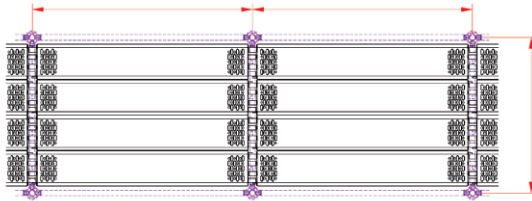


Figure 5.5: B) Multi-bay structure

Permissible platform load for steel decks (configuration A: single-bay (kN/m ²))				
Bay width (m)	Bay length (m)			
-	1.57	2.07	2.57	3.07
0.73	6.0	6.0	4.5	3.0
1.09	6.0	6.0	4.5	3.0
1.40	6.0	6.0	4.5	3.0

Permissible platform load for steel decks (configuration B: multiple-bay (kN/m ²))				
Bay width (m)	Bay length (m)			
-	1.57	2.07	2.57	3.07
0.73	6.0	6.0	4.5	3.0
1.09	6.0	4.5	3.0	3.0
1.40	4.5	3.0	2.0	2.0

5.3 Wooden planks

The following needs to be observed whenever wooden-plank platforms are to be fitted:

- The quality of the wooden planks must be carefully checked; damaged planks may never be used!
- The wood quality of the planks has to comply with the relevant European standards
- Wooden planks must be arranged and fitted so that they cannot lift or slip away
- It is not permitted to have gaps in the platform that are wider than 25 mm
- The arrangement of two planks in a longitudinal direction has to be carried out in accordance with figure 5.6

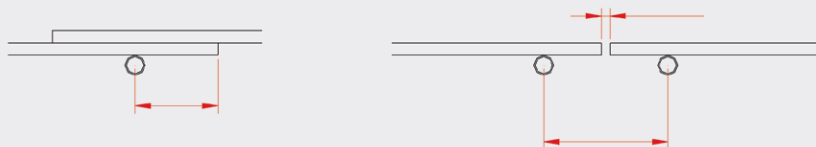


Figure 5.6: Arrangement of the wooden planks

- Depending on their size, the planks need to be supported on intermediate ledgers in accordance with the following table:

Permissible support interval for wooden planks (m) (if the structure is used as a safety fall protection scaffold, other loads apply)						
Scaffold class	Plank width (cm)	Plank thickness				
		3.0 cm	3.5 cm	4.0 cm	4.5 cm	5.0 cm
1, 2, 3	20	1.25	1.50	1.75	2.25	2.50
	24 and 28	1.25	1.75	2.25	2.50	2.75
4	20	1.25	1.50	1.75	2.25	2.50
	24 and 28	1.25	1.75	2.00	2.25	2.50
5	20, 24, 28	1.25	1.25	1.50	1.75	2.00
6	20, 24, 28	1.00	1.25	1.25	1.50	1.75

Permissible platform load for wooden planks (kN/m ²) Plank thickness = 3.0 cm				
Bay length (m)	1.57 (1 intermediate ledger)	2.07 (1 intermediate ledger)	2.57 (2 intermediate ledgers)	3.07 (2 intermediate ledgers)
Bay width (m)				
0.73 (3xW = 20 cm)	6.0	6.0	6.0	4.5
1.09 (4xW = 24 cm)	6.0	6.0	4.5	3.0
1.40 (6xW = 20 cm) (5xW = 24 cm)	6.0	4.5	3.0	2.0

6 ANCHORAGE AND STABILISATION

Scaffolding structures that are free-standing are not stable and therefore always need to be anchored to a secure façade. In principle, a scaffold represents a “weak” system since it is merely the linking up of a number of loose components. In order to obtain a strong and rigid structure, the scaffold therefore needs to be stabilised through the addition of a few specific components.

Façade scaffolds need to be stabilised in all of the following four different sections:

- A) Stabilisation of the sections vertical to the façade
- B) Stabilisation of the inner section parallel to the façade
- C) Stabilisation of the outer section parallel to the façade
- D) Stabilization of the horizontal sections of the scaffold

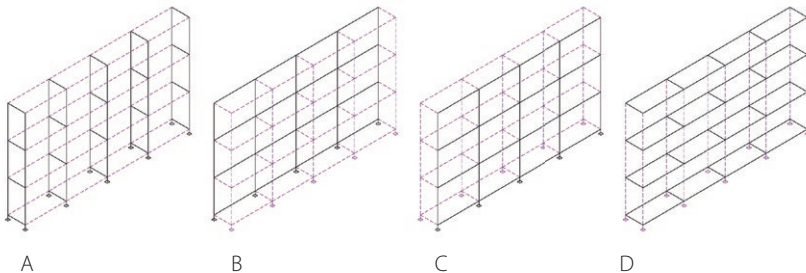


Figure 6.1 Sections of the façade scaffolding

Anchors (or tie bars) and V-shaped anchors are used to stabilise sections A and B, vertical reinforcements are used for section C and steel decks or horizontal reinforcements for sections of type D.

6.1 Anchorage

To stabilise the scaffolding in a vertical direction to the façade, scaffold anchors are used, which are to be attached to each row of standards. The anchors provide general stability for the scaffold (the scaffold cannot tip over) and local stability (the buckling length of the vertical tubes is reduced).

A scaffold anchor consists of:

- An anchorage tube with special hooks for attachment to the anchoring means*/ eyebolts
- A standard coupler for attaching the anchorage tube to the standards
- An eyebolt for fixing the anchorage tube to a sufficiently stable façade

The anchors are mounted with couplers on the inner and outer standards near (< 0.30 m) the nodal point of the standard and the tubular ledger (see figure 6.2).



Figure 6.2a: Example of an anchor

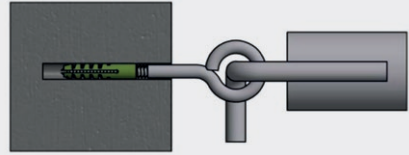


Figure 6.2b: Example of an anchor point



Note: Ensure that the anchors and the anchorage base material can always absorb the loads demanded by the scaffold structure. These loads will need to be assessed and calculated.

* = The anchorage components described must always be checked and tested on site. Number of tests = 10 % of the number of anchor points used. This serves to check the maximum permissible load. The minimum removal force required at any respective anchor point can be determined with the aid of a testing device.



Figure 6.2c: Example of a tie bar test

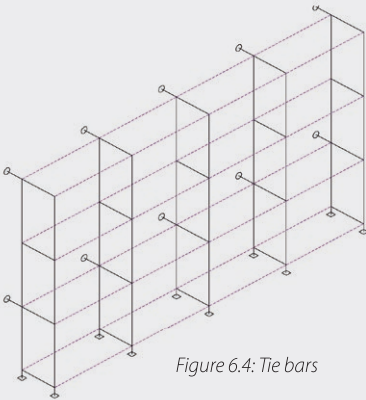


Figure 6.4: Tie bars

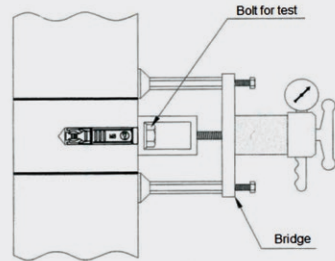


Figure 6.3: Example of a test stand for a wall anchor

The number of anchors required is determined by calculation or the structure anyway corresponds to the standard configuration. The anchors are applied in a regular pattern all over the scaffolding. In general, the standard configurations need to be checked to determine an anchorage pattern for every individual scaffold. Depending on the required number of anchors, three main pattern arrangements can be distinguished. See figure 6.5:

- 8-metre pattern and 4-metre on the outer standards
- 4-metre pattern or 4 metre offset pattern
- 2-metre pattern, anchors at each node at 2 metre intervals

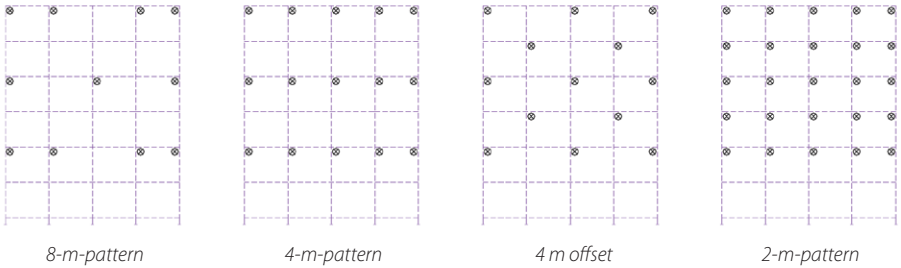


Figure 6.5 Anchorage arrangement patterns

V-shaped anchor

If it is not possible to use anchors attached to both the inner and outer standards to stabilise the inner section parallel to the façade, anchors may be applied which are attached at an angle of approx. 60 degrees, a kind of V-shaped anchor. Depending on the horizontal loads ensuing, V-shaped anchors need to be attached parallel to the façade and preferably at least at both ends of the scaffolding. Please also consult the standard configurations when positioning V-shaped anchors.

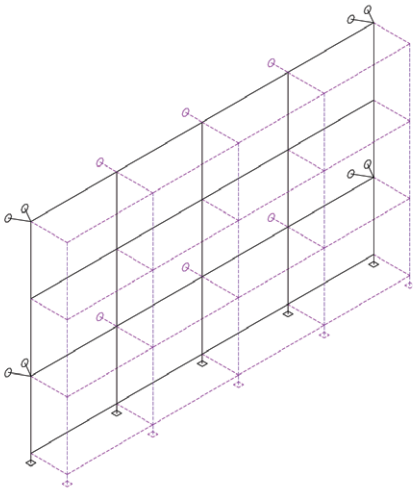


Figure 6.6 V-shaped anchors

6.2 Reinforcement / Stabilisation

Vertical reinforcement/stabilisation

Vertical reinforcements are used parallel and perpendicular to the façade to stabilise the outer section of the scaffolding. Vertical reinforcements are attached perpendicular to the façade at least in every fifth bay, at each bay level and in every end bay.

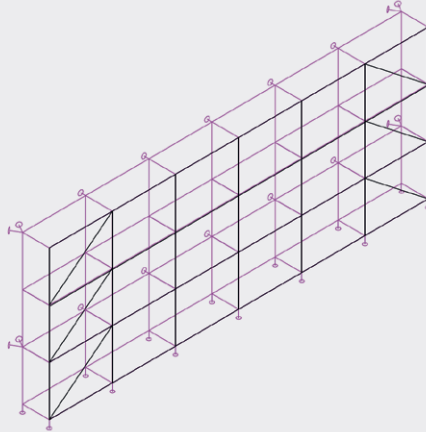


Figure 6.7 Vertical reinforcement

Horizontal bracing

The horizontal sections of the scaffolding are stabilised by horizontal reinforcements either in the form of steel decks or wooden planks in the case of platforms. These horizontal reinforcements must be attached at least in every fifth bay and at each bay level.

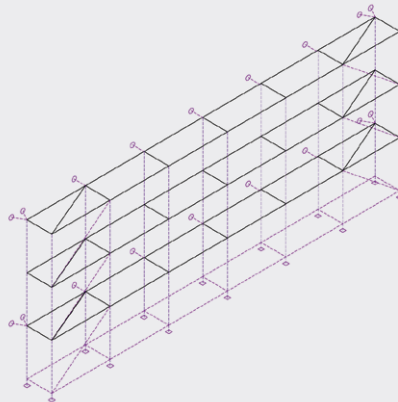


Figure 6.8 Horizontal reinforcement for wooden platforms

7 ACCESS TO THE RINGSCAFF SCAFFOLDING

There are two different ways to access the RINGSCAFF scaffolding:

- Access via special ladder frames made of aluminium or plywood
- Access via aluminium stairways

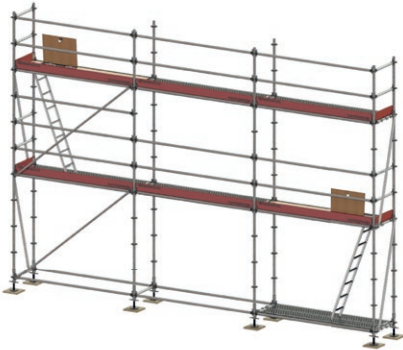


Figure 7.1 Access to higher levels via ladder frames

7.1 Access via ladder frames

Access to higher levels can be made possible by fitting aluminium or plywood platforms with integrated ladder and special access hatches. The ladder frames are integrated into the working platforms. The maximum safe working load for scaffolding with aluminium or plywood platforms is 2 kN/m² pursuant to EN12811 - class 3. Verticals in the ladder frame bay need to be anchored at least every four metres.

7.2 Access via stairways

Another possibility for access to higher scaffold levels is to erect a separate stair tower for the scaffolding. In this respect the RINGSCAFF system offers two different configurations as possible solutions:

- Construction of an additional bay (0.732 x 2.572 m) on the outside of the scaffolding. The stairs are all assembled in the same direction. The user is able to enter each level of the scaffold. Users can walk around this level and take the next staircase up to the higher level (Figure 7.2).
- Construction of an additional bay (1.400 x 2.572 m) at an access bay in the scaffolding with a length of 2.572 m. The stairs are mounted in opposite directions. Access to the working platforms is at the top of the stairs (Figure 7.3).



Figure 7.2 Stairway configuration A



Figure 7.3: Stairway configuration B

Verticals in the stairway bay need to be anchored at least every four metres.

8 ASSEMBLY AND DISMANTLING OF THE SCAFFOLDING

8.1 Inspection before assembly

The following important points need to be considered before starting to erect a scaffolding:

- The function of the scaffolding must be known
- It must be ensured that all assembly work is carried out exclusively by professional companies and that only these companies may use the scaffolding: in addition, it must be ensured that all parties concerned have qualified and competent staff available
- All loads that occur on the scaffold structure and its surroundings and the position of the loads on the scaffold and its surroundings need to be verified; the different loads being:
 - the scaffold structure's own weight
 - payloads on the working platforms
 - wind loads (possibly together with cladding)
- The alignment of the scaffolding to the building must be known: it must be ensured that the plan for the scaffolding corresponds to local conditions
- The ground conditions at the positioning of the scaffolding need to be checked
- The condition of the façade at the anchorage points needs to be checked
- It has to be ensured that all loads ensuing can be carried by the scaffolding structure
- It must be ensured that all vertical loads from the scaffolding can be supported by the ground and that all horizontal loads can be absorbed by the anchors and the building façade
- The position of the scaffolding in relation to the surroundings needs to be checked
- All (local) safety requirements must be known
- Possible explosion or fire hazards must be known
- It must be ensured that the scaffold erectors are suitably qualified to assemble the scaffolding structure
- It has to be ensured that the scaffolders have been comprehensively instructed
- The safety and functionality of all tools used during assembly is to be checked
- Check all material used in the construction of the scaffolding



Damaged material may not be used in any scaffold structure!

8.2 Assembly procedure

8.2.1 The assembly starts with the arrangement of the components in their approximate positions.

8.2.2 Position the standard lead-off adapter on the base jack (see Figure 9.1) and use wooden boards under the base plate of the jacks to distribute the loads across the ground.



Figure 8.1

8.2.3 Repeat these steps, positioning base jacks at all four corners of the bay, which are then connected with tubular ledgers/intermediate ledgers; see Figure 8.2.



Figure 8.2

8.2.4 At the highest point above the ground, start levelling the base with a spirit level and by adjusting the wing nut on the threaded base jack. Lock down all wedge connections with a hammer blow. Now the base is fixed and the scaffolding can be erected in a vertical direction.

8.2.5 Insert standards into the threaded base jacks. Use 3-metre standards on the outside and 2-metre standards on the inside of the scaffolding for greater convenience during assembly/disassembly, see Figure 8.3.

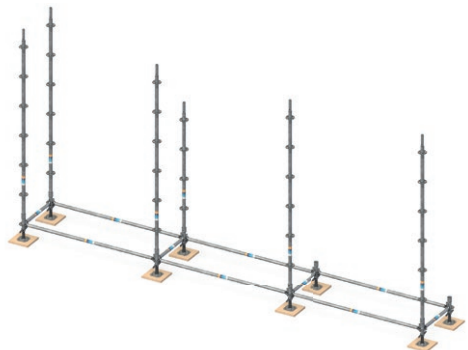


Figure 8.3

- 8.2.6 Begin construction of the first level by securing the tubular ledgers and intermediate ledgers at the designated points; see Figure 8.4.



Note: It may be necessary for the steel deck to be fitted at this base level to facilitate assembly of the first level.

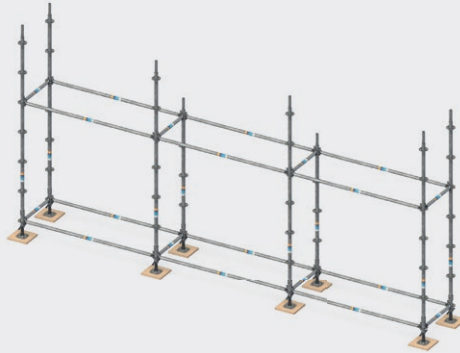


Figure 8.4

- 8.2.7 Diagonal stabilisation at the front sides need to be fitted at least in every 5th bay, from bottom to top of the scaffolding or as specified in the design configuration; see Figure 8.5. Diagonal reinforcement results in increased stability of the scaffold structure. (Note: if toe boards having a horizontal rigidity effect are used, the adjacent tubular ledgers can be removed).

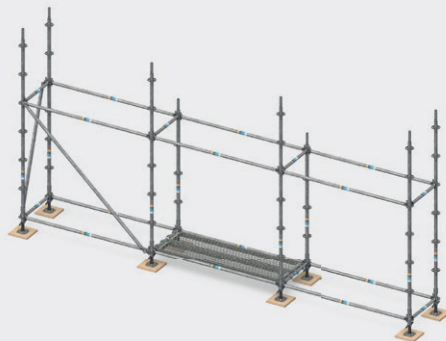


Figure 8.5

- 8.2.8 After completion of the first level, the next levels can be built. It is very important to work **safely** when erecting the next levels. This means that a side protection system such as a guardrail has to be fitted before moving up to the next level. The RINGSCAFF system offers various solutions for this side protection during assembly; see Figures 8.6A, 8.6B and 8.6C. Assembly instructions for higher levels are described in section 8.3 of these Instructions for Assembly and Use.

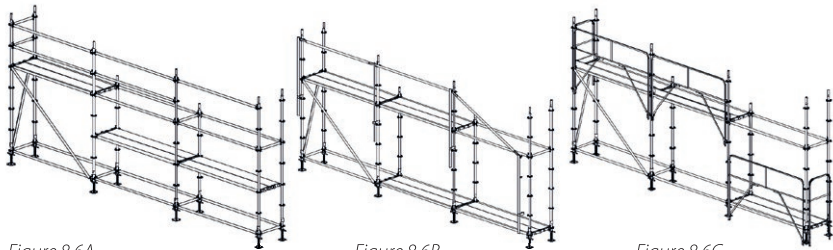


Figure 8.6A

Figure 8.6B

Figure 8.6C

Figure 8.6A shows how standard RINGSCAFF components are used to temporarily erect an additional assembly level at a height of 1 m above the actual working level. The guardrails and steel decks for the next level can be fitted from here.

Figure 8.6B shows how to work with a temporarily-installed guardrail system. The temporarily-installed guardrail system consists of guardrail posts and guardrails. These components can be installed from the level below along the entire next higher level. After ascending to the upper level, the permanent guardrails can then be mounted and the temporarily-fitted guardrails can be installed on the next higher level.

Figure 8.6C shows the use of permanently-fitted guardrails, which can be attached directly from the lower level for use on the next higher level. After access to the next level, permanent guardrails for the next higher level can be installed immediately. This ensures that the user is always protected against falling from the highest assembled level.

It is important to ensure that work is always carried out safely on unfinished levels! For further instructions on higher levels see section 8.3.

If, for whatever reason, users cannot be protected by the above-mentioned side protection systems (Figures 8.6A, 8.6B or 8.6C), they must be safeguarded by wearing a safety harness that is secured to the guardrails or standards. The positioning of the secure attachment points on the tubular ledgers and standards of the scaffold structure can be found in Section 8.3. Please consult the information provided there!

8.2.9 Fit steel decks on the first level from below as per Figure 8.7.



Note: If wooden scaffold planks are used, intermediate ledgers are to be inserted on the longitudinal ledgers. For safe access to higher levels of the scaffolding, stairs, inner ladders or inner ladder frames can be used. An additional bay needs to be erected on the outside of the scaffold for the assembly of the stairway; see Illustration 8.7.

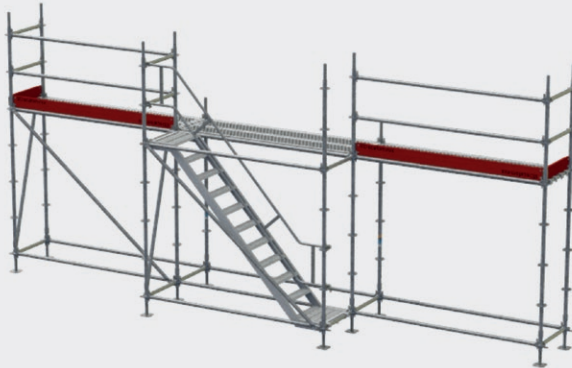


Figure 8.7

- 8.2.10 The next higher level must always be decked from below. A stairway or ladder is used to access the next level. Ensure that all working levels have side protection consisting of double guardrails and a toe board. Stairways, ladders or ladder frames are used for erecting further levels.



Figure 8.8

- 8.2.11 The scaffolding should be physically connected to the building façade at the first possible point, ideally at the second level. The anchorage patterns shown in this manual should be consulted. Each row of standards needs to be anchored to the façade.
- 8.2.12 When the assembly has been completed and the scaffold is ready for use, the proper and correct instructions for using the scaffold are to be indicated on the so-called "Scaff-Tag".

8.3 Assembly instructions for higher levels

8.3.1 Stability

During erection or dismantling of the scaffolding, no anchorage is available after a certain point in time to prevent the scaffolding from tipping over. In this case precautions need to be taken. For example, temporary supports can be attached to the scaffold (see Figure 8.9)

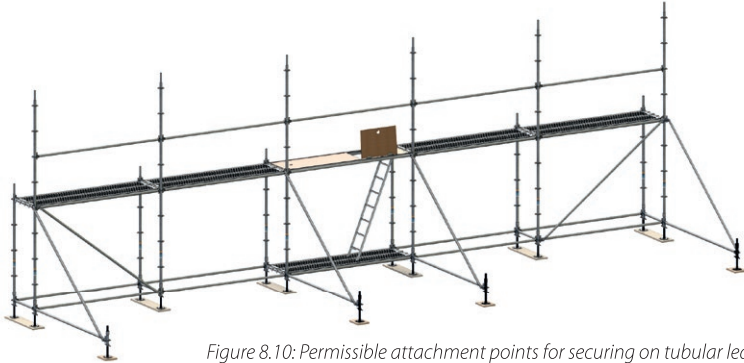


Figure 8.10: Permissible attachment points for securing on tubular ledgers (red)

8.3.2 Measures against fall hazards

When assembling additional scaffold levels, there may be a risk of falling. The assembly work must be carried out in such a way that fall hazards are avoided and that the remaining risks are reduced to a minimum. The scaffolder / scaffolding contractor is to carry out an appropriate risk assessment for each individual case or for each assembly step to ensure safety. Possible safety measures:

- Use of RINGSCAFF mounting safety guardrails (see section 8.3.2.2)
- Use of appropriate personal protective equipment such as a safety harness (see section 8.3.2.1)
- Combination of the above-mentioned protective measures

Only components that comply with approval Z-8.22-869 may be used for the mounting safety guardrail.

When working with a safety harness, a height rescue plan needs to be available at the construction site.

When using a safety harness as protective equipment, it must be approved for use in the scaffolding industry.

When using a safety harness, it is extremely important to use the correct attachment points for connecting the suspension hook. Figure 8.10 and Figure 8.11 show the correct attachment points for connection to a tubular ledger or a perforated ring.

Figure 8.10: Permissible attachment points for securing on tubular ledgers (red)

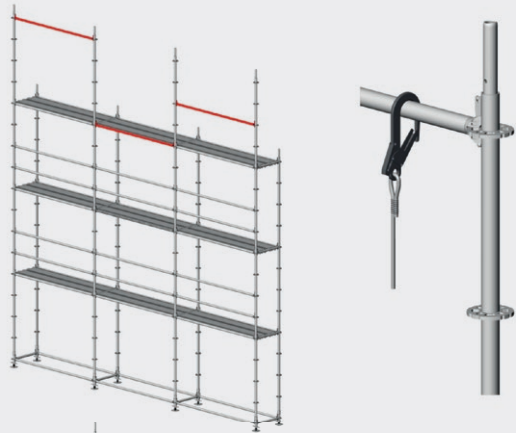
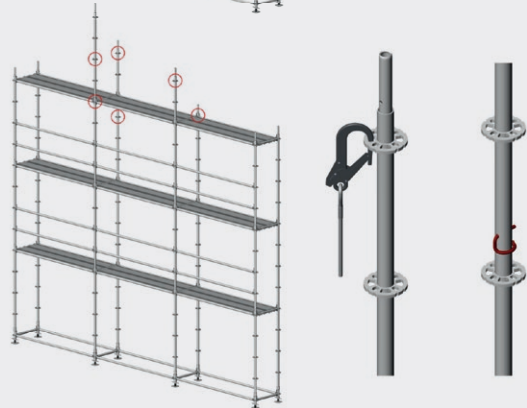


Fig. 8.11: Permissible attachment points for securing on perforated rings (red circles). Perforated ring at least 1.0 m above the highest floor. If the standard is attached to a tube connector above the highest level, the standards need to be secured with a locking pin (Figure on right)



- The actual attachment points should always comply with the local regulations and guidelines issued by the professional associations.
- The attachment points always need to be as high as possible above the actual working level and at a minimum height of 1.0 m above it.
- The snap hook on the safety harness may only be connected to closed parts of the scaffolding to ensure that the hook cannot slip off. Open sections such as e.g. tube ends may not be used as attachment points for the safety harness.
- The use of a safety harness with shock absorbing line is only permitted if the height of fall is at least 5.75 m when measured vertically from the attachment point to the ground.

If it is not possible to use a mounting safety guardrail and/or safety harness due to the nature of a particular type of scaffolding, or if the mounting safety guardrail and/or the safety harness do not provide adequate protection, special additional safety measures will need to be taken.

- The scaffolding work must be carried out by qualified scaffolders
- Scaffold erectors need to be specially trained in applying any other safety measures that may deviate from the norm
- Steep edges should be clearly marked for scaffolders and users of the scaffold

Fall protection measures are not required when the working and access areas are to be enlarged within a distance of no more than 0.30 m from supporting and sufficiently large surface areas.

8.3.3 Vertical height transport of scaffolding components

8.3.3.1 Construction lifts

A lift has to be used for the erection and dismantling of scaffolding with a height of more than 8 metres (measured from the height of the working level). Such elevator installations may e.g. be manually-operated pulley systems.

Motor-driven construction lifts may be dispensed with if the height of the scaffolding does not exceed 14 metres and the length is not more than 10 metres.



Please refer to the manual lift instruction handbook before use!

8.3.3.2 Vertical height transport by hand

In scaffolding bays where the vertical transport of scaffolding components is manual, full side protection (guardrails and knee rails) are required on the lower working levels. On the top level of the scaffold, a mounting safety guardrail (MSG) is sufficient. At least one person should stand on each scaffold level when scaffold materials are transported vertically (see Figure 8.12).

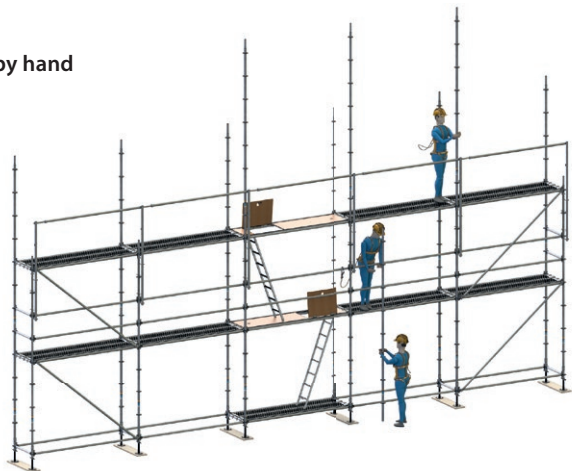


Bild 8.12: Beispiel für die vertikale Beförderung per Hand

8.3.4 Assembly of the scaffolding

The scaffold builder initiates the necessary fall protection precautions (see Section 8.3.2) as a part of the overall risk assessment. The following safety measures can be taken as fall protection during assembly or dismantling of the scaffold:

8.3.4.1 Mounting safety guardrails (MSG)

The ultra-modern guardrails by scafom-rux consist of two basic components: a mounting safety guardrail post and an extendable guardrail. The guardrail post has to be used in accordance with local provisions and requirements.

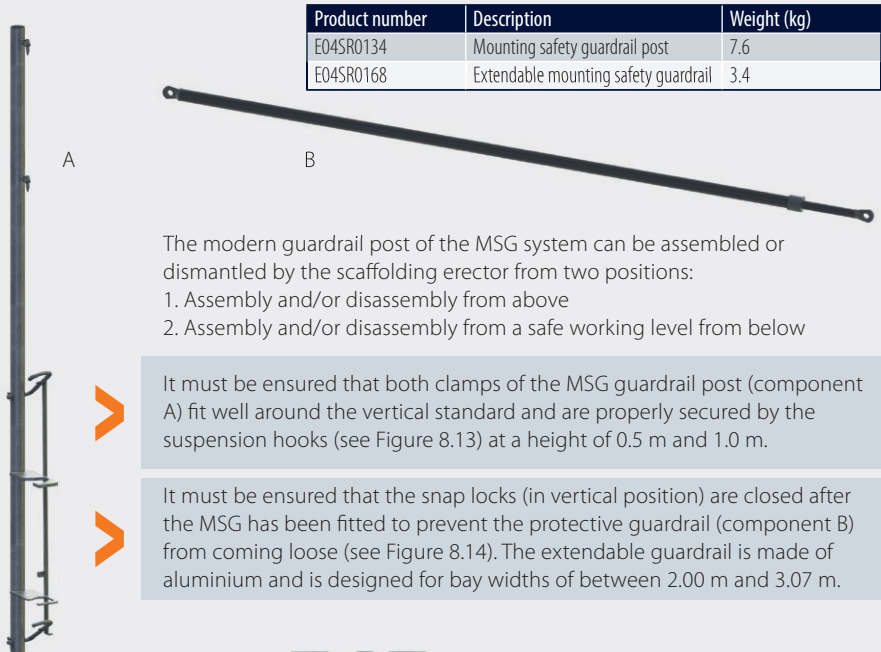


Figure 8.13



Figure 8.14

i. Fitting of the mounting safety guardrail from a safe working level

The MSG is erected on all sides of the scaffolding where there is a risk of falling.

- Attach the MSG post to the outer scaffold standard (Figure 8.15a)
- Attach the MSG guardrail to the first MSG post and attach the second MSG post to the guardrail (Fig. 8.15b)
- Attach the second MSG post to the outside of the scaffold (Fig. 8.15c)
- Other MSG components can be attached in a similar way in the horizontal direction (Fig. 8.15d)



Figure 8.15a



Figure 8.15b



Figure 8.15c

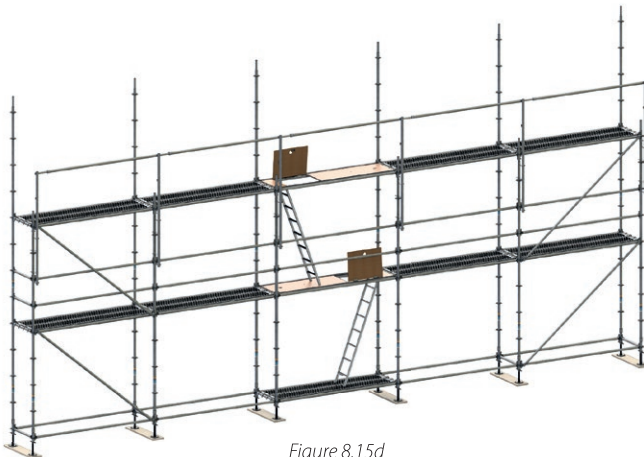


Figure 8.15d

ii. Further assembly of the scaffolding, protected by MSG

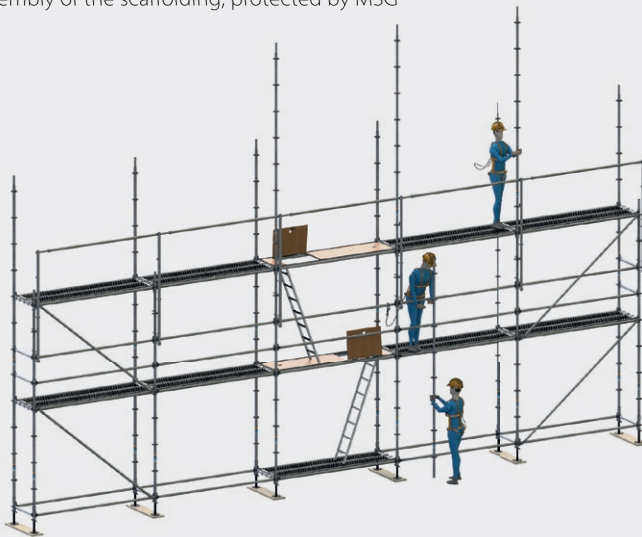


Figure 8.16

- Enter the top level of the scaffolding through the hatch of the ladder frame, which is located in the access bay, then close the hatch immediately after ascending
- Begin fitting the standards on the lower standards, commencing with the access bay of the scaffolding
- Install side protection in the access bay of the scaffolding
- Continue with the above procedure in a horizontal direction from the access bay
- If required, connect standards together with a locking pin to ensure a secure connection against tensile forces (Figure 8.17)

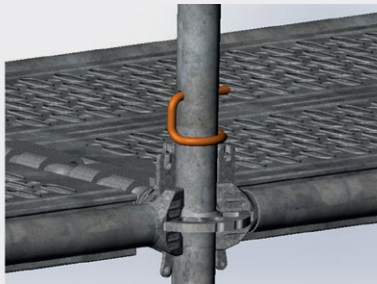


Figure 8.17

- When the final bay of the scaffolding is reached, the front guardrails need to be fitted (Fig. 8.18)



Figure 8.18

- Fit the longitudinal and transverse ledgers of the second level at a height of 2.0 m above the current working level (Figure 8.4)
- Attach the steel decks or wooden planks of the RINGSCAFF system on to the transverse ledgers (for further information, see section 5.2 of this manual) (Figure 8.5)
- If anchorage is required at this level, attach the anchors to the scaffold in accordance with section 6 of this manual

8.3.4.2 Further assembly of the scaffolding, protected by safety harness and MSG in the access bay of the scaffolding



A) MSG in the access bay; assembly to be carried out from the lower, fully-secured scaffold level (section 8.3.7.1).

Fitting of the next levels, starting with the access bay and protected by MSG.

Enter the top level of the scaffolding through the hatch of the ladder frame, which is located in the access bay, then close the hatch immediately after ascending.

Begin fitting the standards on the lower standards, commencing with the access bay of the scaffolding.

Install side protection in the access bay of the scaffolding.

If required, connect standards together with a locking pin to ensure a secure connection against tensile forces (Figure 8.17).

Figure 8.19: Fitted mounting safety guardrail (MSG)

B) Further assembly of the scaffolding, protected by a safety harness

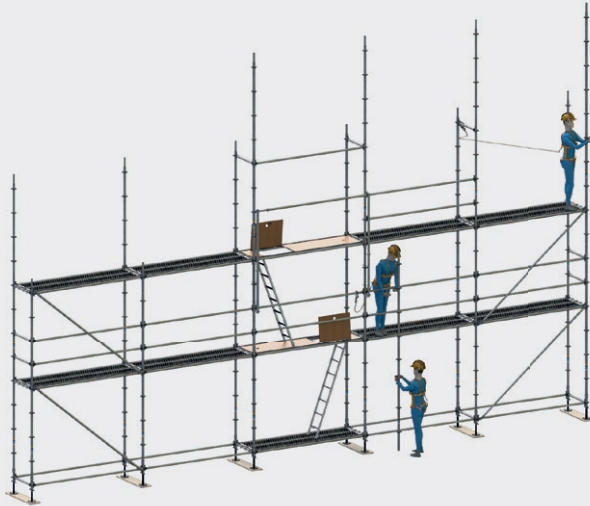


Figure 8.18

- Starting with the access bay:
 - Before leaving the protected scaffold bay, attach the safety harness with the snap hook at a prescribed attachment point on the scaffold (see section 8.3.2)
 - Fit the next vertical standards
 - Assemble the guardrails in the new scaffold bay
 - If required, connect standards together with a locking pin to ensure a secure connection against tensile forces (Figure 8.17)
- After reaching the end of the scaffold, attach the front guardrails (Fig. 8.18)
- Fit the tubular ledgers and intermediate ledgers of the second level at a height of 2.0 m above the current working level (Figure 8.4)
- Install the steel decks or wooden planks of the RINGSKAFF system in combination with intermediate ledgers above the lower intermediate ledgers (for further information, see section 5.2 of this manual) (Figure 8.5)
- If anchorage is required at this level, attach the anchors to the scaffold in accordance with section 6 of this manual

8.4 Use of the scaffolding

The following is required and necessary to use the scaffolding:

- The persons working on or with the scaffold must know the maximum permissible load of the scaffold. This means the maximum permissible load on the platform and the maximum number of platforms that may be loaded.
- No changes may be made to the scaffold without the approval of the responsible scaffold design engineer.
- The scaffold may not be used in difficult weather conditions such as storms (wind force > 6 on the Beaufort scale), thunderstorms and lightning, snowfall, hail or ice.
- The scaffolding must be inspected regularly, especially after extreme weather conditions.

8.5 Dismantling procedure

The following work and checks represent the basis for the safe dismantling of the RINGSCAFF scaffolding system:

- A) All platforms must be free of loose material. The scaffold is to be inspected to ensure that it is still in the condition it was erected in e.g. that no components or ties have been removed or incorrectly reattached. The "Scaff-Tag" on the scaffold must indicate that the structure is no longer approved for use.
- B) Dismantle the scaffolding in the reverse order to the assembly procedure. This means starting at the top and dismantling from level to level downwards. During dismantling and modification, the scaffold must always be in a stable, usable and safe condition.
- C) Remove the toe boards and guardrails from the highest platform.
- D) Only after checking that all components previously attached to the standards have also been removed can the standards mounted above the platform level be removed.
- E) From a temporarily-mounted platform under the highest platform level, remove the decks (of steel) from the highest platform.
- F) Remove all tubular ledgers and intermediate ledgers from the highest platform level.
- G) Always work from a platform that is no more than 2 m below the level from which the components are removed. Dismantle the scaffold step by step in the order described above.
- H) Remove the tie bars one after another as the scaffolding is dismantled.



Note: Tie bars should only be removed when they prevent further dismantling of the scaffolding.

- I) The components are to be carefully and safely transported to the ground from hand to hand down the scaffolding or by a suitably safe lowering method such as by rope, crane, lift, etc.

9 VARIOUS SOLUTIONS

Since RINGSCAFF is a modular scaffolding system, there are various solutions for erecting a safe working platform at height around all types of façades. This section describes some of these solutions.

9.1 Corner solutions

Due to the flexibility of the system, it is possible to fit various types of corner solutions. Figures 9.1 to 9.5 below show some of these solutions for right-angled corners using steel decks in the scaffold.



Figure 9.1



Figure 9.2



Figure 9.3



Figure 9.4



Figure 9.5

Figure 9.1 Corner solution with 2 standards, 1 intermediate ledger and 1 double tubular ledger

Figure 9.2 Corner solution with 3 standards and 2 intermediate ledgers

Figure 9.3 Corner solution with 4 standards and 3 intermediate ledgers

Figure 9.4 Corner solution with 3 standards, 2 intermediate ledgers and 1 side bracket (2 steel decks)

Figure 9.5 Corner solution with 4 standards, 2 intermediate ledgers

9.2 Platform extensions

Side brackets (see Figure 9.6) can be used to extend the working level and/or to fill gaps between the scaffolding and the building.

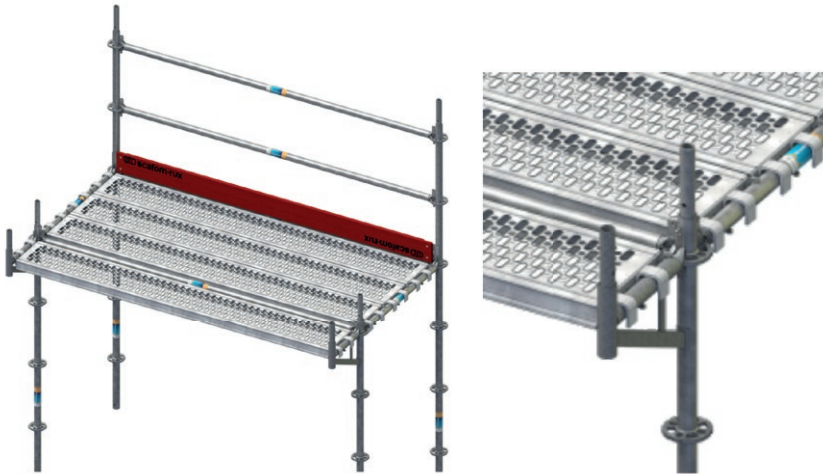


Figure 9.6

Side brackets are available in widths of 0.39 m (for one steel deck) and 0.73 m (for 2 steel decks).

The side brackets are mounted on the standards by attaching the bracket's welded wedge head to the perforated ring on the standards. After a hammer blow on the wedge, the bracket is affixed to the scaffolding and can take up loads.

If side brackets are used to create a wider working platform, the steel decks on the side brackets need to have at least the same load-bearing capacity as the steel decks on the main platform area.

For anchorage patterns and permissible standard loads when using side brackets in the scaffold structure, see Appendix I, "Standard configurations".

9.3 Bridging Solutions

For the construction of passageways in scaffolding structures, the RINGSCAFF system can be used to construct bridge-like structures using RINGSCAFF components such as the standard lead-off adapter, standards and system diagonals; see Figure 9.7. The bays directly around the bridge structure need to be reinforced with RINGSCAFF system diagonals.

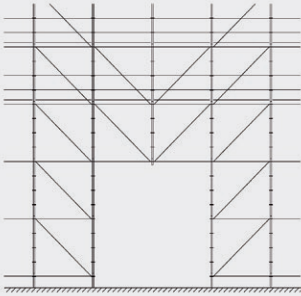


Figure 9.7

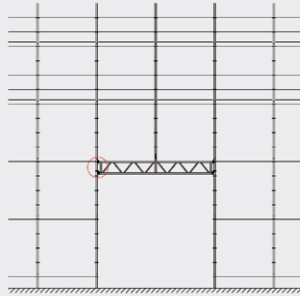
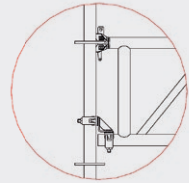


Figure 9.8



Another solution for bridging is presented by RINGSCAFF lattice girders and lattice girder couplers, see Figure 9.8.

The lattice girders are available in the system lengths 4.14 m, 5.14 m and 6.14 m. These lengths enable two bays of the sizes 2.07 m, 2.57 m or 3.07 m to be bridged.

The upper side of the lattice girder is attached to the standards with the welded wedge head connections. The bottom chord of the lattice girder is attached to the standards with special lattice girder couplers, see details in Figure 9.8.

To prevent the lattice girders from buckling due to the load on the girder, they need to be stabilised by reinforcing the pressure tube using tubes and fixing components; see Figure 9.9 (alternative: use of anchor tubes to stabilise the lattice girder bridge at the wall).

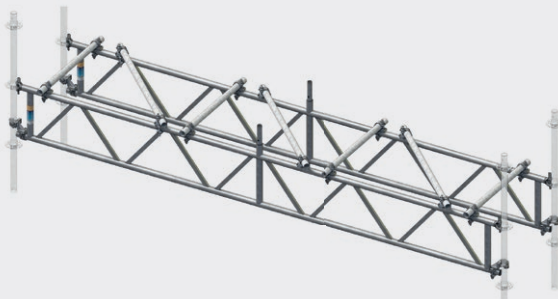


Figure 9.9

10 RULES AND REQUIREMENTS REGARDING THE MIXING OF SCAFFOLD COMPONENTS

The RINGSCAFF system and its manufacture have been certified as approved in accordance with standards such as EN12810 / EN12811. In addition, mixing with Layher Allround® and Plettac Contur® / Futuro® components has also been certified as approved in the German mixing approval certificates:

- Z-8.22-901 Mixing with Layher Allround®
- Z-8.22-911 Mixing with Plettac Contur® / Futuro®

This means that an evaluation and approval has been carried out by an external, accredited body, thereby ensuring and substantiating the full compatibility of these mixed components. In other words:

- A mixing approval describes components that may be used. This applies both to “original approvals” as well as for “mixing approvals”. Currently, there are no fundamental legal uncertainties regarding mixing approvals.
- In principle, there is a risk that components not included in a certification (original or mixing approval) may be fitted into a scaffolding. It always takes a little time to include all components in such an approval.
- Approvals for scaffolding products need to encompass a “user manual”. In the case of a mixed scaffold, the relevant manual will need to be adapted (properties, standard configurations).
- There is no loss in value of the scaffolding material in the case of mixed components when the “original approvals” are modified.
- The inclusion of new components in an original mixing approval does not initially have any impact. New components do not automatically have an immediate effect on the mixing approval: a modification of the mixing approval is required at a later date.
- The risk of “site closure” or liability in the event of accidents exists for both unmixed and mixed scaffolds. This principle applies as long as the respective mixing approval is available and the instructions (for safety) are observed.

Please check in the appendices pertaining to the mixing approval the components concerned and the corresponding standard configurations for each individual mixing system.

11 APPENDIX I: STANDARD CONFIGURATIONS

The following RINGSCAFF structures have been designated standard configurations for façade scaffolding (see diagrams on the following pages).

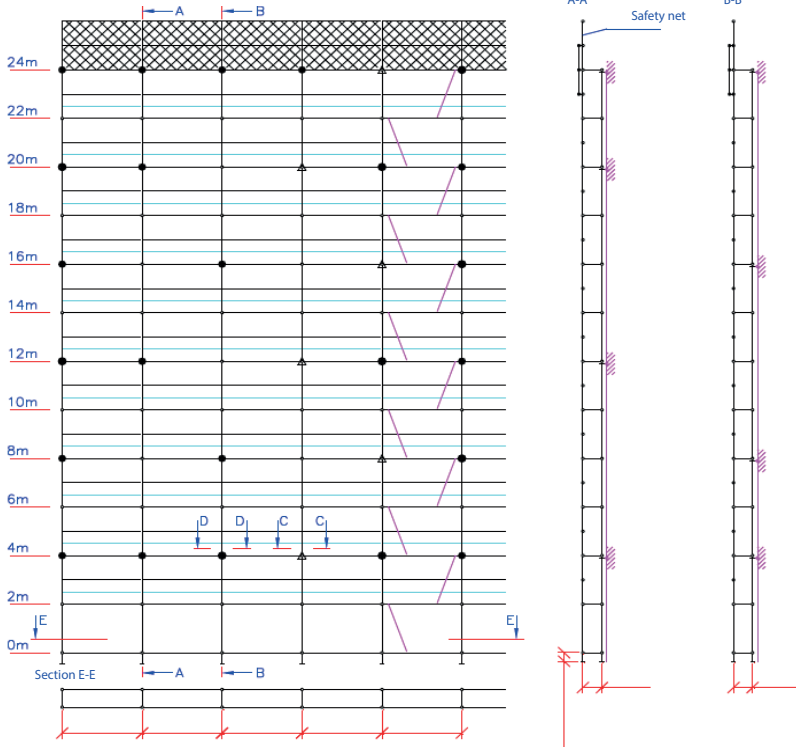
Configuration No.	Bay width (m)	Bay length (m)	Load class (kg/m ²)	Cladding	Side brackets	Bridging
Alternative 1	0.73	3.07	3 (200)	Without cladding	-	-
Alternative 2	0.73	3.07	3 (200)	Without cladding	Included	-
Alternative 3	0.73	3.07	3 (200)	Without cladding	-	Included
Alternative 4	0.73	3.07	3 (200)	Without cladding	Included	Included

Figure III: Standard configurations

The loads shown in the diagrams are safe working loads according to EN12810 / EN12811 (load factor of 1.5 integrated).

RINGSCAFF scaffolding up to class 6 and/or other heights: please contact your technical service department.

Standard configuration: EN12810 - 3D - SW06/ 300 - H2 - A- L5
Alternative 1: Without inner side brackets

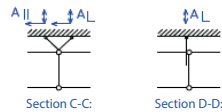


- Bay length x width = 3.07 m x 0.73 m
- Load according to load class 3 EN 128-11 (2kN/m²)
- Anchorage every 8 m
- Steel decks and safety net
- Scaffold unclad
- Scaffold in front of partially open façade

Max. standard loads:
• Outer standard: 13.5 kNN
• Inner standard: 8.8 kN

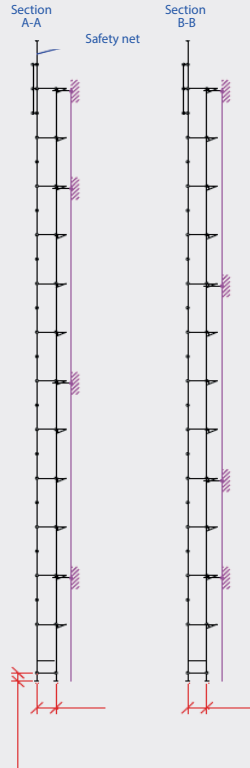
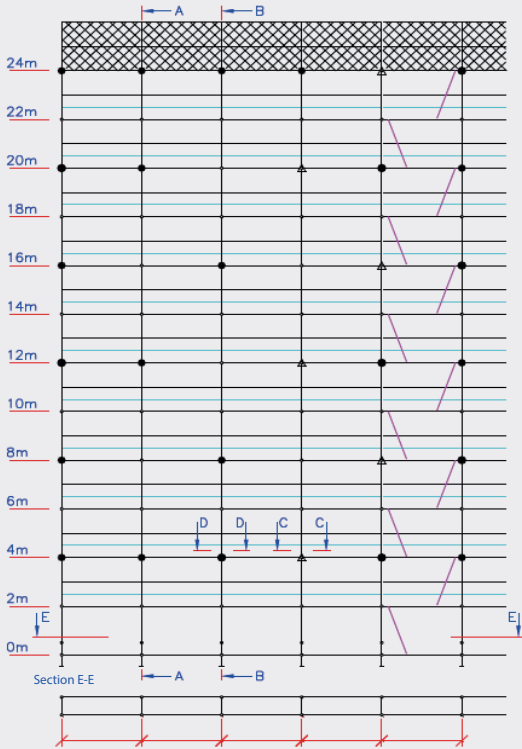
Max. anchor forces
• Orthogonal to façade: +/- 3.7 kN (AL)
• Parallel to façade: +/- 2.0 kN (All)

- Anchorage on inner standard
- ▼ V-shaped tie bar



Loads according to German approval Z-8.22-869; schematic drawing - diagonals are not shown!

Standard configuration: EN12810 - 3D - SW06/ 300 - H2 - A - LS
 Alternative 2: With inner side brackets



- Bay length x width = 3.07 m x 0.73 m
- Load according to load class 3 EN 128-11 (2kN/m²)
- Anchorage every 8 m
- Steel decks and safety net
- Scaffold unclad
- Scaffold in front of partially open façade

Max. standard loads:

- Outer standard: 13.5 kN
- Inner standard: 16.4 kN

Max. anchor forces

- Orthogonal to façade: +/- 3.7 kN (AL)
- Parallel to façade: +/- 2.0 kN (All)

- Anchorage on inner standard
- ▼ V-shaped tie bar

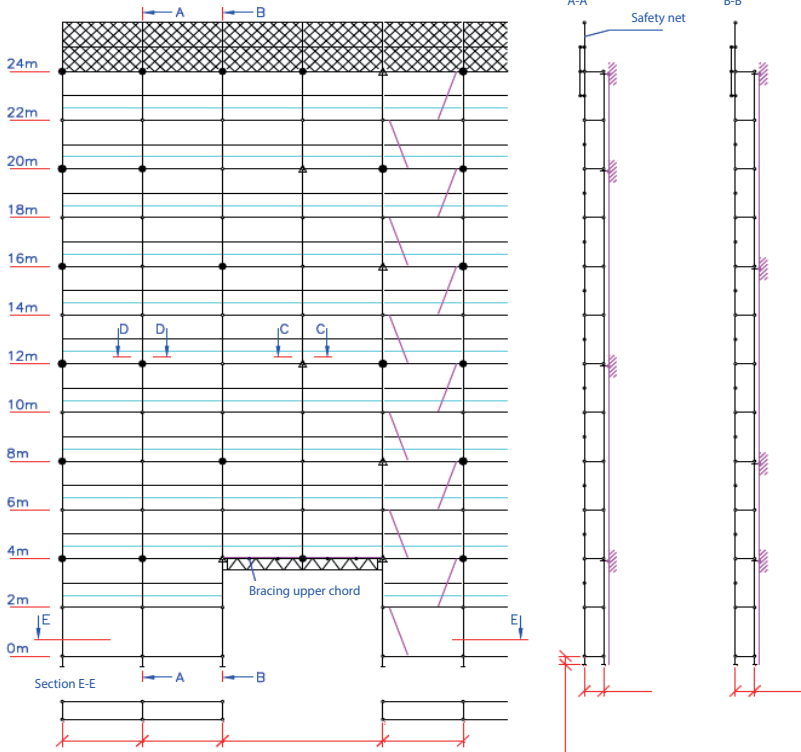


Section C-C:



Section D-D:

Standard configuration: EN12810 - 3D - SW06/ 300 - H2 - A- L5
Alternative 3: Without inner side brackets, with bridging



- Bay length x width = 3.07 m x 0.73 m
- Load according to load class 3 EN 128-11 (2kN/m²)
- Anchorage every 5 m
- Steel decks and safety net
- Scaffold unclad
- Scaffold in front of partially open façade

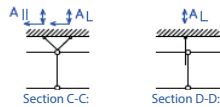
Max. standard loads:

- Outer standard: 13.5 kN
- Inner standard: 8.8 kN

Max. anchor forces

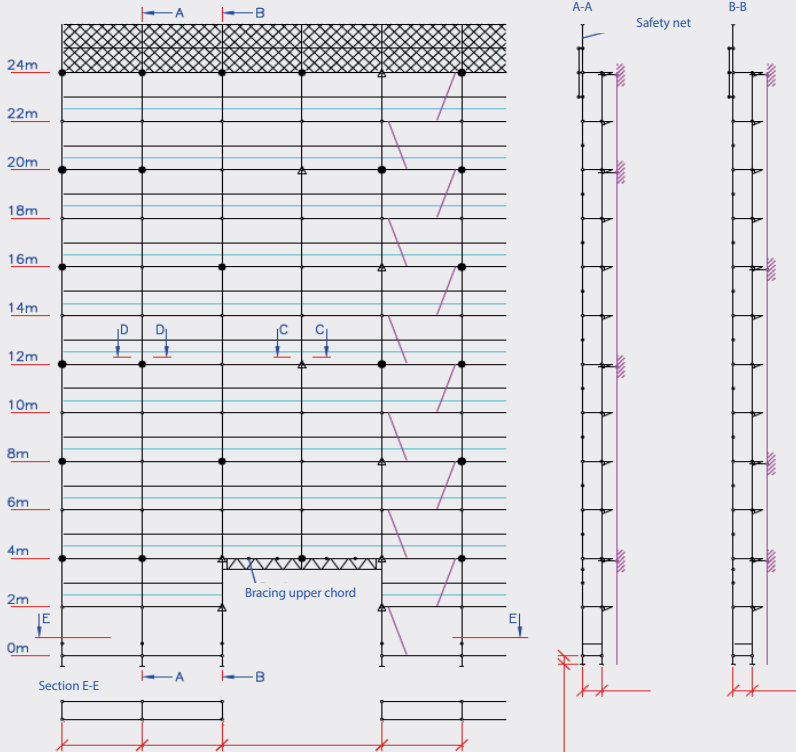
- Orthogonal to façade: +/- 3.7 kN (AL)
- Parallel to façade: +/- 2.0 kN (All)

- Anchorage on inner standard
- ▼ V-shaped tie bar



Loads according to German approval Z-8.22-869; schematic drawing - diagonals are not shown!

Standard configuration: EN12810 - 3D - SW06/ 300 - H2 - A - LS
 Alternative 4: With inner side brackets and bridging



- Bay length x width = 3.07 m x 0.73 m
- Load according to load class 3 EN 128-11 (2kN/m²)
- Anchorage every 8 m
- Steel decks and safety net
- Scaffold unclad
- Scaffold in front of partially open façade

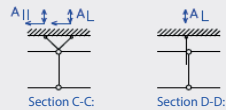
Max. standard loads:

- Outer standard: 13.5 kN
- Inner standard: 16.4 kN

Max. anchor forces

- Orthogonal to façade: +/- 3.7 kN (AL)
- Parallel to façade: +/- 2.0 kN (All)

- Anchorage on inner standard
- ▼ V-shaped tie bar



12 APPENDIX II: VERIFICATION CRITERIA FOR SCAFFOLDING COMPONENTS

In order to ensure that the scaffolding is erected safely, it is very important that the components used do not show any signs of damage.

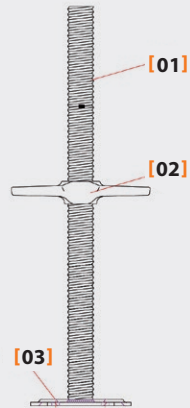
For this reason, scafom-rux has defined inspection criteria for the main components of the "RINGSCHAFF" modular scaffolding system. These serve as instructions for the persons who work with or maintain the scaffolding, i.e. scaffold erectors and on-site supervisors as well as stock supervisors and staff.

Verification criteria have been defined for the following components that have a load-bearing function in the scaffolding structure:

- 1) Base jacks
- 2) Standard lead-off adapters
- 3) Standards with tube connector
- 4) Tubular ledgers / Transverse ledgers / Support ledgers
- 5) Intermediate ledgers
- 6) Vertical diagonal
- 7) Side brackets
- 8) Toe boards
- 9) Steel decks
- 10) Anchorage

If the component part does not satisfy the inspection criteria, it should no longer be used but be replaced on site and returned to the depot for maintenance and/or repair by qualified personnel or be entirely disposed of.

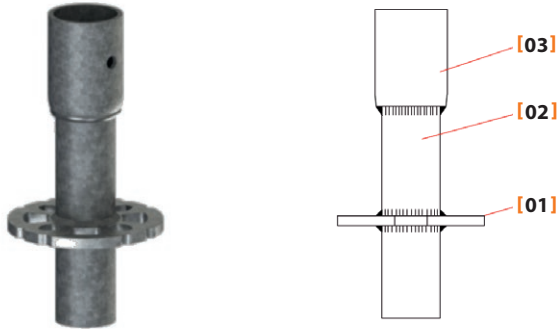
12.1 Base jack



Verification criteria:

- 1) The base plate **[03]** has to be noticeably flat and visibly perpendicular to a flat surface.
- 2) The base jack may not be rusty.
- 3) The threaded shaft **[01]** has to be noticeably straight.
- 4) The threaded shaft may not show any visible signs of damage such as breaks, cracks or dents.
- 5) The welding joints on the threaded shaft and the base plate may not show any cracks.
- 6) The threaded shaft has to be fitted with a restraining element to limit the upper position of the adjustable wing nut **[02]**.
- 7) The adjustable wing nut must be able to be turned over the entire thread length from the bottom to the limit point without any problems.
- 8) The wing nut may not show any signs of damage or cracks.
- 9) The base plate may not show any cracks or dents.
- 10) The base plate must be free of concrete or other impurities.

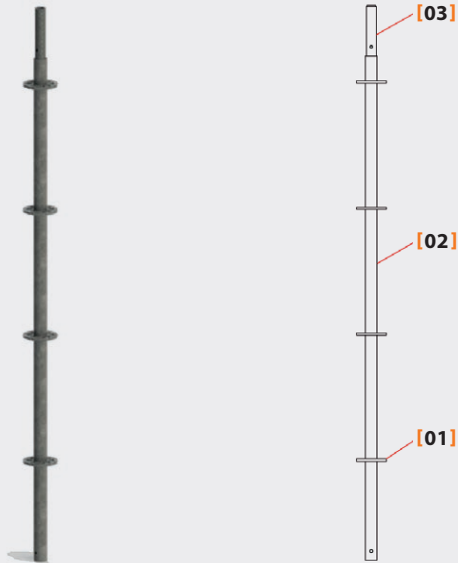
12.2 Standard lead-off adapter



Verification criteria:

- 1) There may be no visible signs of damage such as breaks, cracks or dents on the standard lead-off adapter.
- 2) The standard lead-off adapter may not be rusty.
- 3) The perforated ring [01] may not be bent nor may it show any cracks.
- 4) The welding joints between the perforated ring and the tube [02] as well as between the standard lead-off adapter [03] and the tube may not show any cracks.
- 5) The standard lead-off adapter must be round to accommodate a scaffold tube.
- 6) The contact areas of the tube [02] both on the upper side as well as on the underside must be smooth and may not carry any impurities.
- 7) The standard lead-off adapter must be free of concrete or other impurities

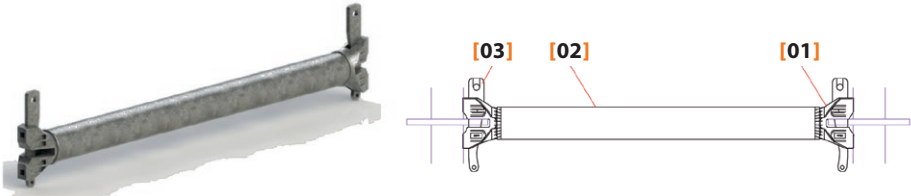
12.3 Standard with tube connector



Verification criteria:

- 1) The standard may not show any visible signs of damage such as breaks, cracks or dents.
- 2) The standard may not be rusty.
- 3) The standard has to be visibly straight.
- 4) The perforated rings [01] may not be bent nor may they show any cracks.
- 5) The welding joints between the perforated ring and the tube [02] may not show any cracks.
- 6) The contact areas of the tube [02] both on the upper side as well as on the underside must be smooth and may not carry any impurities.
- 7) The tube connector [03] has to be attached in the standard tube so that it is straight, firmly affixed and without any play.
- 8) The standards must be free of concrete or other impurities. In particular, there may be no soiling on the connecting surfaces to tubular ledgers and diagonals.

12.4 Tubular ledger / Transverse ledger / Support ledger



Verification criteria:

- 1) The tubular ledger may not show any visible signs of damage such as breaks, cracks or dents.
- 2) The tubular ledger may not be rusty.
- 3) The tubular ledger has to be visibly straight and in a horizontal position when connected to a standard.
- 4) The welded joints between the tubular ledger end pieces [01] and tube [02] may not show any cracks.
- 5) The wedges [03] must be freely movable and secured against loosening.
- 6) The wedges may not be bent or cracked.
- 7) The opening on the tubular ledger end pieces has to be straight and easy to fit onto a perforated ring.
- 8) The tubular ledger must be free of concrete or other impurities.

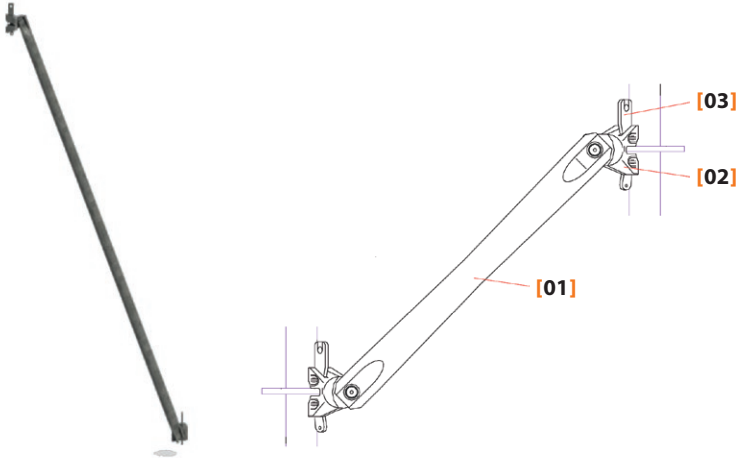
12.5 Intermediate ledger



Verification criteria:

- 1) The intermediate ledger may not show any visible signs of damage such as breaks, cracks or dents.
- 2) The intermediate ledger may not be rusty.
- 3) The intermediate ledger has to be visibly straight.
- 4) The welding joints between the clamps [02] and tube [03] may not show any cracks.
- 5) The wedge [01] must be freely movable and secured against loosening.
- 6) The wedge may not be bent or cracked.
- 7) The clamps on the intermediate ledger must be straight and easy to fit onto the scaffold tube.
- 8) The intermediate ledger must be free of concrete or other impurities.

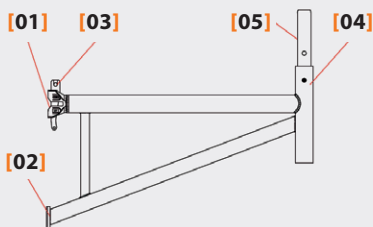
12.6 Vertical diagonal



Verification criteria:

- 1) The horizontal front guardrail may not show any visible signs of damage such as breaks, cracks or dents.
- 2) The horizontal front guardrail may not be rusty.
- 3) The horizontal front guardrail [01] tube has to be visibly straight.
- 4) The wedges [02 + 03] must be freely movable and secured against loosening.
- 5) The wedges may not be bent or cracked.
- 6) The opening on the front guardrail end pieces has to be straight and easy to fit onto a perforated ring.
- 7) The horizontal front guardrail must be free of concrete or other impurities.

12.7 Side bracket



Verification criteria:

- 1) The side bracket may not show any visible signs of damage such as breaks, cracks or dents.
- 2) The side bracket may not be rusty.
- 3) The side bracket has to be visibly straight and in a horizontal position when connected to a standard.
- 4) The welding joints between the tubular ledger end piece **[01]** and / or clamps **[02]** may not show any cracks.
- 5) The wedge **[03]** must be freely movable and secured against loosening.
- 6) The wedge may not be bent or cracked.
- 7) The opening on the tubular ledger end pieces has to be straight and easy to fit into a perforated ring opening.
- 8) The contact area of the tube **[04]** on the upper side must be smooth and may not carry any impurities.
- 9) The tube connector **[05]** has to be attached in the tube **[04]** so that it is straight, firmly affixed and without any play.
- 10) The side bracket must be free of concrete or other impurities.

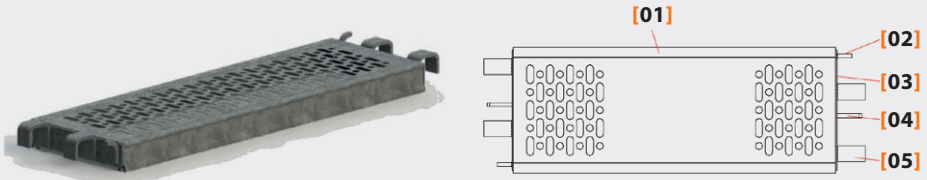
12.8 Toe board



Verification criteria:

- 1) The toe board has to be visibly straight.
- 2) Minimum height of the toe board: 150 mm; thickness: 30 mm.
- 3) The toe board [01] may not show any visible signs of damage such as breaks or cracks.
- 4) The toe board needs to be equipped with two steel end sections [02].
- 5) The end sections may not be bent or show cracks. They have to be well fixed to the wooden board.
- 6) The toe board must be free of concrete or other impurities.

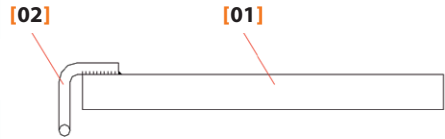
12.9 Steel deck



Verification criteria:

- 1) The steel deck may not show any visible signs of damage such as breaks, cracks or dents, especially in the longitudinal support profiles on the underside.
- 2) The steel deck may not be rusty.
- 3) The steel deck has to be visibly straight and must lie flat with its support hooks flush-fitting on the carrying ledgers **[01]**.
- 4) The support hooks **[02]** may not be bent or cracked.
- 5) The welding joints between the hooks and the end section **[02]** as well as those of the end section and the deck profile **[03]** may not show any cracks.
- 6) The deck retainers **[04]** must be in place and functional.
- 7) The side supports **[05]** have to be in their envisaged position.
- 8) The steel deck must be free of concrete or other impurities.

12.10 Anchorage



Verification criteria:

- 1) The anchorage may not show any visible signs of damage such as breaks, cracks or dents.
- 2) The anchorage may not be rusty.
- 3) The anchoring tube [01] has to be visibly straight.
- 4) The hook [02] may not be bent or cracked.
- 5) The welding joints between hook and tube may not show any cracks.
- 6) The anchorage must be free of concrete or other impurities.

GENERAL TERMS AND CONDITIONS OF SALE, DELIVERY AND PAYMENT OF RUX GMBH

§ 1 – Scope

1. These General Terms and Conditions shall apply exclusively; any terms and conditions of orderer that are contrary to or deviate from our Terms and Conditions shall be deemed unaccepted unless expressly agreed to in writing. Our General Terms and Conditions of Sale, Delivery and Payment shall also apply when we carry out the delivery to the orderer without reservation although we are aware of contrary or deviating terms and conditions on the part of the orderer.
2. Our General Terms and Conditions of Sale, Delivery and Payment shall also apply to all future transactions with the orderer.

§ 2 – Quotations

1. All parts and elements of your quotations are submitted without engagement.
2. We reserve the right of ownership and copyright to illustrations, drawings, calculations and other documentation. The documents mentioned may not be made accessible to third parties without our express written consent.

§ 3 – Prices and Terms of Payment

1. Insofar as nothing to the contrary has been agreed contractually, our prices are quoted "ex works", excluding packing and freight costs; such shall be invoiced separately.
2. All prices indicated are net prices; they are quoted exclusive of the statutory level of VAT valid on the day of delivery.
3. Insofar as nothing to the contrary has been agreed contractually, the orderer shall be deemed as being in default at the latest 30 days after receipt of invoice or request for payment inasmuch that default has not occurred earlier on the basis of a dunning letter having been sent. The orderer shall not be entitled to make any deductions for discount without a specific written agreement.
4. The orderer shall only be entitled to offsetting rights when same's counter claims have been deemed legally binding, are uncontested or have been agreed by us. Moreover, the orderer shall only be entitled to assert retention rights when the counter claims arise from the same contractual relationship as the claim for payment.
5. Any order values below our minimum order value of EUR 50.00 shall be subject to an administration fee of EUR 20.00.

§ 4 – Delivery and Delivery Dates

1. Any prospective periods and dates for delivery and services that we mention shall always be interpreted as being approximate unless a fixed period or a fixed date has been expressly confirmed or agreed. Insofar as shipments have been agreed, delivery periods and delivery dates shall always refer to that point in time when delivery is made to the forwarder, carrier or other third party commissioned with the transportation.
2. Should we be in default with the delivery for reasons for which we are responsible, orderer's claims to compensation for the delay shall be limited to an amount of 0.5% of the value of the delivery for each completed week of delay, but restricted to a maximum amount of 5% of the value of the delivery. This limitation shall not apply when the default is a result of wilful intent, gross negligence or an infringement of essential contractual obligations (these are obligations that need to be satisfied to enable the contract to be properly fulfilled in the first place and whose observation our contractual partner may generally rely on).
3. Any claims for compensation on the part of the orderer for delays in delivery as well as any claims for compensation in lieu of the delivery that go beyond the limits mentioned in Clauses 1. and 2. above shall be deemed as excluded in all cases of a delay in delivery, even after expiry of any deadline that may have been set us for delivery. This shall not be applicable in cases of wilful intent and gross negligence or cases of injury to life, body and health where there is a mandatory liability; a change of the burden of proof to the disadvantage of the orderer shall not apply in this case. The orderer may only withdraw from the contract within the scope of the statutory requirements insofar as we are responsible for the delay in delivery.
4. Upon our request, the orderer shall be obliged to declare within a reasonable period of time whether, on account of the delay in delivery, same will withdraw from the contract and/or demand compensation in lieu of the delivery or insist on performance.
5. Should the orderer default in acceptance or infringe other obligations

to cooperate, we shall be entitled to insist on compensation including any additional expenditure for the damage we incur. In this case, the risk of accidental destruction or of a coincidental deterioration of the purchased item shall pass to the orderer at that point in time when same is in default of acceptance.

6. Any acts of God or operational disruptions arising in our facilities or those of our suppliers which, through no fault of our own, temporarily prevent our delivering the contractual object at the agreed time or within the agreed period shall modify the dates and periods mentioned under Clauses 1. to 5. of this Paragraph by the duration of the disruptions caused by these circumstances. The orderer may withdraw from the contract when corresponding disruptions lead to a delay in performance of more than four months. Other rights to withdraw shall remain unaffected by this.
7. The adherence to agreed delivery dates or rightfully set delivery periods presupposes that our sub-suppliers punctually supply us with the ordered input materials or purchased parts necessary for the fulfillment of the order (reservation of self-supply). Should, as a consequence of unpunctual delivery by our sub-suppliers, we not be able to observe the agreed or set delivery dates, we shall not be deemed as being in default when the input material was ordered punctually and we have otherwise made every reasonable effort to ensure prompt delivery of the input material.

§ 5 – Transfer of Risk

1. Insofar as nothing to the contrary has been agreed contractually, "ex works" delivery shall be deemed as agreed. This shall also apply when the purchased item is sent to another address at the request of the orderer. Risk shall then transfer to the orderer when delivery of the purchased item is made to the transporting party.
2. Insofar as such is desired by the orderer, we shall take out transport insurance coverage for the shipment; the costs incurred are to be borne by the orderer.
3. Generally-speaking, the material is supplied unpacked and not protected against corrosion. In the case of material that is supplied packed, the orderer shall assume the obligation of unpacking and disposal of the packaging at own expense.

§ 6 – Warranty for Defects

1. Any warranty rights on the part of the orderer presuppose that same has properly fulfilled its obligations with regard to the inspection and making of complaints about defects pursuant to § 377 of the German Commercial Code (HGB). § 377 of the German Commercial Code shall also apply correspondingly when we perform just work on behalf of the orderer. Moreover, the delivered goods have to be stored and processed or used in a proper and appropriate manner. Proper and appropriate storage in the case of wooden material, for example, would include its ventilation. A proper and appropriate handling of the goods when assembling or dismantling scaffolding would require the observation of all prescribed technical requirements – including the DIN standards – and adherence to all approval regulations and state guidelines.
 2. Insofar as the purchased item has a defect, we are always to be approached first and foremost for rectification as per § 439 of the German Civil Code (BGB).
 3. Should we not be willing or able to perform rectification or should such extend beyond a reasonable period of time for reasons for which we are responsible or should rectification fail for other reasons, the orderer shall at own discretion be entitled either to withdraw from the contract or to demand a lowering of the purchase price (reduction).
 4. Insofar as nothing to the contrary has been agreed below, any more extensive claims on the part of the orderer – irrespective of the legal foundation – shall be deemed excluded. We shall not therefore be liable for damage that has not occurred directly to the delivered object; in particular, we shall not be liable for lost earnings or other financial losses incurred by the orderer.
- The above exemption from liability shall not apply when the cause of damage is the result of wilful intent or gross negligence or in cases of injury to life, body and health. Moreover, it shall not apply when a guarantee has been assumed regarding the condition of the object or its durability.
- The above exemption from liability shall also not apply to such damage

caused by the culpable infringement of essential contractual obligations (these are obligations that need to be satisfied to enable the contract to be properly fulfilled in the first place and whose observation our contractual partner may generally rely on). Our liability in such circumstances shall be limited to the contractually-typical, foreseeable amount of damage provided it is not a case of wilful intent or gross negligence or when we have assumed guarantees.

5. Warranty claims on the part of the orderer shall be limited to twelve months. This shall not apply when legislation as per § 438 Clause 1 [2] of the German Civil Code (Building Structures and Components for Building Structures), § 479 Clause 1 of the German Civil Code (Right of Recourse) and § 634a Clause 1 [2] of the German Civil Code (Construction Defects) stipulate longer periods.

§ 7 – Total Liability

1. Any more extensive liability for compensation and reimbursement of expenditure than that envisaged in § 6 – irrespective of the nature of the claims asserted – shall be deemed excluded. This shall not apply to claims asserted against us pursuant to §§ 1 and 4 of the Product Liability Act. This exemption from liability shall likewise not apply in cases of wilful intent, gross negligence and injury to life, body and health or in cases of the infringement of essential contractual obligations (these are obligations that need to be satisfied to enable the contract to be properly fulfilled in the first place and whose observation our contractual partner may generally rely on).

The claim to compensation from an infringement of essential contractual obligations shall however be limited to the contractually-typical, foreseeable amount of damage insofar as it is not a case of wilful intent or gross negligence or there is liability due to a case of injury to life, body and health. A change of the burden of proof to the disadvantage of the orderer shall not apply in this case.

2. Insofar as our liability is excluded or limited, the same shall also apply to the personal liability of our employees, workers, co-workers, representatives and agents.

§ 8 – Retention of Title

1. We reserve the right of ownership to the purchased item until full payment of the purchase price including the incidental expenses (freight, packing etc.). In the event of any behaviour on the part of the orderer that is contrary to the contractual obligations, in particular in a case of default in payment, we shall be entitled to withdraw from the contract and repossess the purchased item. We shall be authorised to remarket the purchased item after repossessing it. After deducting the appropriate amount for remarketing costs, the remaining proceeds shall be set off against the obligation of the orderer.

2. The orderer shall be obliged to treat the purchased item with care. Orderer shall, at own expense, take out adequate reinstatement-value insurance coverage for the item against the risks of fire, water damage and theft. The orderer shall carry out any maintenance or repair work without delay – should such become necessary – at own expense.

3. The orderer shall be obliged to notify us immediately in writing in the event of seizure or other interventions by third parties. In such a case, the orderer shall also be obliged to support us to the full in the judicial and non-judicial assertion of our rights, in particular to make the necessary documents available.

4. The orderer shall be entitled to resell the purchased item in the ordinary course of business. However, same shall herewith assign to us as of now all claims in the amount of the final invoice amount (including value added tax) which shall accrue to same towards its customers or third parties from the reselling. This assignment is regardless of whether the purchased item is resold either with or without any further processing. We hereby accept this assignment. The orderer shall remain entitled to collect the claim within the scope of the ordinary course of business. This entitlement shall lapse when the orderer does not meet its payment obligations from the proceeds obtained or when same is in default with payment. It shall also lapse when insolvency or settlement proceedings are opened against the assets of the orderer or when the orderer suspends payments.

In such cases we shall be entitled to collect the assigned claim ourselves.

The orderer shall be obliged to furnish us with all the information needed for the collection and to hand over all the associated documentation. In such a case the orderer shall also be obliged to inform the debtor (third parties) of the assignment.

5. The processing or modification of the purchased item by the orderer shall always be carried out on our behalf. Should the purchased item be processed together with other objects not belonging to us, we shall acquire co-ownership of the new object in the relationship of the value of the purchased item to the other processed objects at the point in time of processing. The same reservation of title shall apply to the object thus created as to the purchased item conditionally supplied.

6. Should the purchased item be inseparably combined with other objects not belonging to us, we shall acquire co-ownership of the new object in the relationship of the value of the purchased item to the other combined objects at the point in time of combination. Should the combination be such that the object of the orderer is to be regarded as the main object, it shall be deemed as agreed that the orderer transfers proportional co-ownership to us. The orderer shall safeguard the sole or co-ownership thus created on our behalf.

7. At orderer's request, we undertake to release the security – to which we are entitled – insofar as the realisable value of our security exceeds the secured claim by more than 10 percent; the selection of the security to be released shall be incumbent on us. In this case the orderer shall be obliged to mark the scaffolding material in its possession in such a way that, if necessary, it is possible to unequivocally identify the material still in our ownership. Should an assignment of claims be waived, the orderer shall be obliged to disclose upfront any and all claims from the sale of scaffolding material.

§ 9 – Place of Fulfilment, Applicable Law, Court of Jurisdiction

1. Unless anything to the contrary has been agreed, the place of fulfilment shall be the registered offices of our company. These are located in Hagen.

2. The law of the Federal Republic of Germany shall apply exclusively to all business relationships with us. The applicability of the CISG (UN Sales Law) shall be deemed as excluded.

3. Insofar as the orderer is a qualified businessperson, the courts of the Federal Republic of Germany shall have jurisdiction internationally for any and all legal disputes.

The court of jurisdiction shall be the registered offices of the company in all cases. However, we shall also be entitled to file for legal proceedings at the orderer's general court of jurisdiction. These provisions regarding jurisdiction shall also apply to any legal proceedings related to bills of exchange or cheques.

4. Should the orderer violate any requirements of VAT law, in particular regarding the required provision of a VAT ID number, the orderer shall be obliged to compensate us for any taxation disadvantage which may ensue from such. We reserve the right to assert more extensive claims for damages.

§ 10 – Concluding Provisions

Should the contract or these General Terms and Conditions of Sale, Delivery and Payment contain any loopholes, such legally valid provisions shall be deemed as agreed that close such loopholes and which the contractual parties would have agreed upon with a view to the commercial objective of the contract and the purpose of the General Terms and Conditions of Sale, Delivery and Payment if they had known about the loopholes.

As of 4 July 2016

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