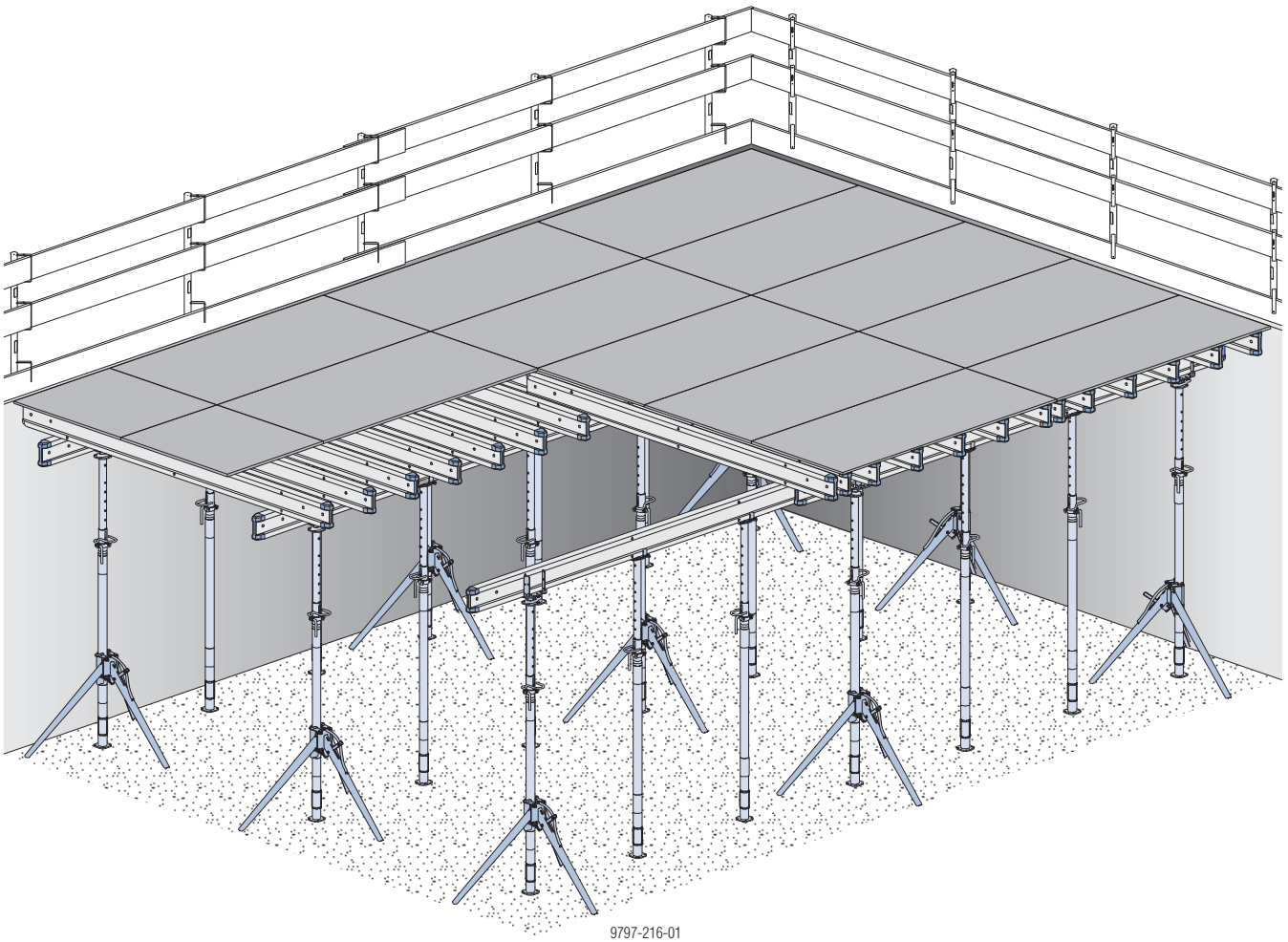
999797014 - 07/2024
en-US

The Formwork Experts.

Dokaflex S

User Information

Instructions for assembly and use



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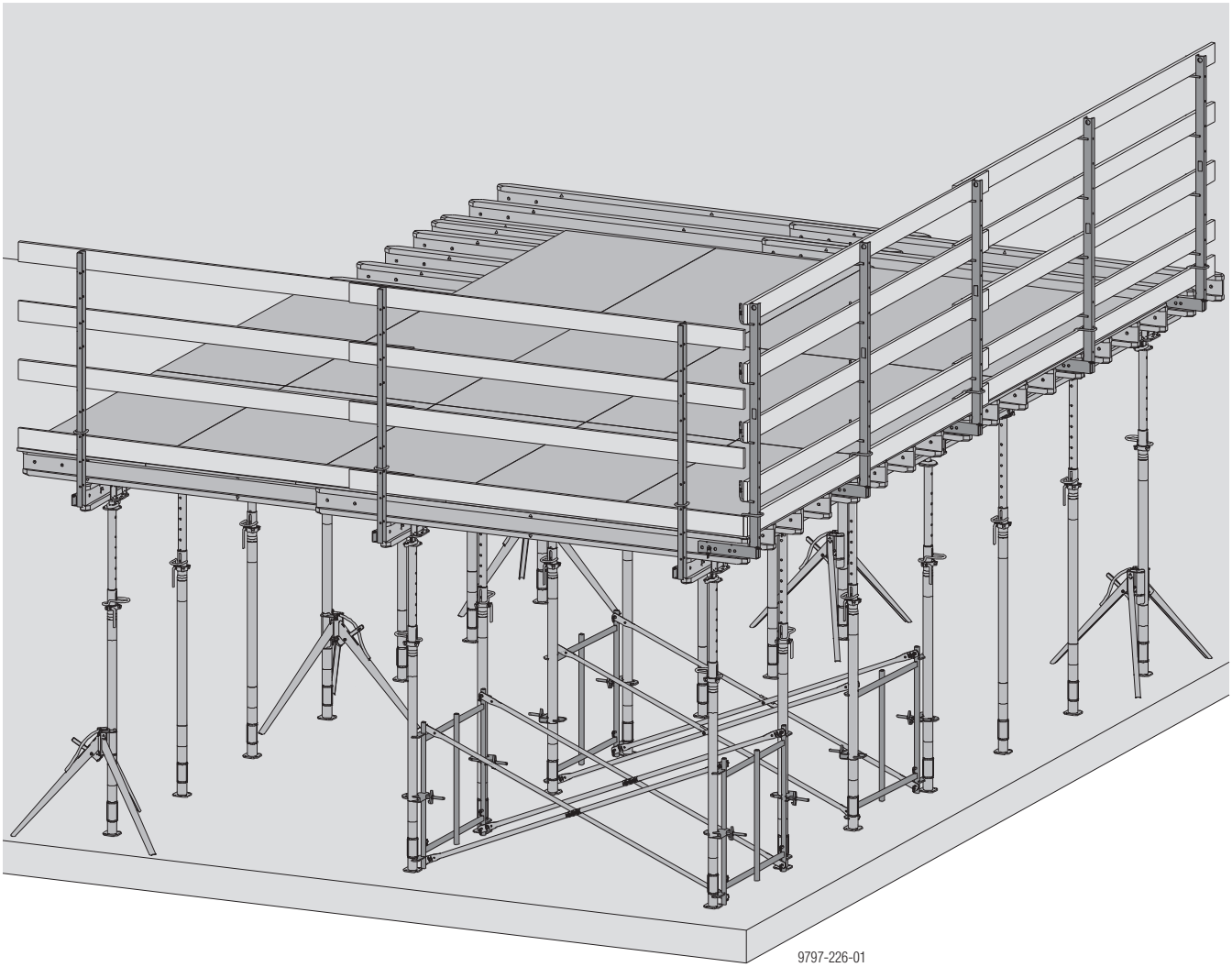

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Introduction

Basic safety warnings

User target groups

- This booklet is aimed at all persons who will be working with the Doka product or system that it describes. It contains information on the standard design for setting up this system, and on correct, compliant utilization of the system.
- All persons working with the product described herein must be familiar with the contents of this booklet and with all the safety instructions it contains.
- Persons who are incapable of reading and understanding this booklet, or who can do so only with difficulty, must be instructed and trained by the customer.
- The customer is to insure that the information materials provided by Doka (e.g. User Information booklets, Method Statements, Operating Instruction manuals, plans etc.) are up to date and available to all users, and that users have been made aware of them and have easy access to them at the usage location.
- In the relevant technical documentation and formwork utilization plans, Doka shows the workplace safety precautions that are necessary in order to use the Doka products safely in the usage situations shown.
  In all cases, users must ensure compliance with the national applicable laws, standards and rules throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

Hazard assessment

- The customer is responsible for drawing up, documenting, implementing and continually updating a hazard assessment at every job-site.
  This booklet serves as the basis for the site-specific hazard assessment, and for the instructions given to users on how to prepare and utilize the system. It does not substitute for these, however.

Remarks on this booklet

- This document can be used as general Instructions for Assembly and Use (Method Statement) or be incorporated into site-specific Instructions for Assembly and Use (Method Statement).
- **The graphics, animations and videos in this document or app sometimes depict partially assembled assemblies and may require additional safety equipment and/or measures to comply with safety regulations.**
  The customer must ensure all applicable regulations are complied with, even if they are not shown or implied in the graphics, animations and videos provided.
- **Individual sections contain further safety instructions and/or special warnings as applicable.**

Planning

- Provide safe workplaces for those using the formwork (e.g. for when it is being erected/dismantled, modified or repositioned etc). It must be possible to get to and from these workplaces via safe access routes!
- **If you are considering any deviation from the details and instructions given in this booklet, or any application which goes beyond those described in the booklet, then revised static calculations must be produced for checking, as well as supplementary assembly instructions.**

Regulations; occupational health & safety

- All laws, Standards, industrial safety regulations and other safety rules applying to the application and utilization of our products in the country and/or region in which you are operating must be observed at all times.
- If a person or object falls against, or into, the sideguard component and/or any of its accessories, the component affected may only continue in use after it has been inspected and passed by an expert.

Rules applying during all phases of the assignment:

- The customer shall ensure that this product is erected and dismantled, repositioned and generally used for its intended purpose in accordance with the applicable laws, standards and rules, under the direction and supervision of suitably skilled persons. These persons' mental and physical capacity shall not in any way be impaired by alcohol, medicines or drugs.
- Doka products are technical working appliances which are intended for industrial / commercial use only, always in accordance with the respective Doka User Information booklets or other technical documentation authored by Doka.
- The stability and load-bearing capacity of all components and units must be ensured during all phases of the construction work!
- Do not step on or apply strain to cantilevers, closures, etc. until suitable measures to ensure their stability have been correctly implemented (e.g. by tie-backs).
- The functional / technical instructions, safety warnings and loading data shall all be strictly observed and complied with. Non-compliance can cause accidents and severe injury (risk of fatality) and serious damage to property.
- Sources of fire in the vicinity of the formwork are prohibited. Heaters are permissible only when used correctly and situated a correspondingly safe distance from the formwork.
- Customer must give due consideration to any and all effects of the weather on the equipment and regards both its use and storage (e.g. slippery surfaces, risk of slipping, effects of the wind, etc.) and implement appropriate precautionary measures to secure the equipment and surrounding areas and to protect workers.
- All connections must be checked at regular intervals to ensure that they are secure and in full working order.
  In particular threaded connections and wedged connections have to be checked and retightened as necessary in accordance with activity on the jobsite and especially after out-of-the-ordinary occurrences (e.g. after a storm).
- It is strictly prohibited to weld or heat Doka products, particularly parts for anchoring, suspension or connecting, and also cast parts, etc.
  Welding radically changes the micro-structure of the materials of which these components are made. This leads to a drastic reduction in failure load, constituting a serious safety risk.
  It is permissible to cut individual tie rods to length with metal cutting discs (introduction of heat at the end of the rod only), but it is important to ensure that flying sparks do not heat and thus damage other tie rods.
  Welding work can be done only on the articles expressly mentioned in the Doka documents as being suitable for work of this nature.

Assembly

- The equipment/system must be inspected by the customer before use, to ensure that it is in suitable condition. Steps must be taken to rule out the use of components that are damaged, deformed, or weakened due to wear, corrosion or rot (e.g. fungal decay).
- The use of our safety systems and formwork systems in combination with those of other manufacturers could be dangerous, risking injury to health and damage to property, and therefore requires separate verification by the user.
- The equipment/system must be assembled and erected in accordance with the applicable laws, standards and rules by suitably skilled personnel of the customer's, having regard to any and all required safety inspections.
- It is not permitted to modify Doka products; any such modifications constitute a safety risk.

Erecting the formwork

- Doka products and systems must be set up in such a way that all loads acting upon them are safely transferred!

Pouring

- Do not exceed the permitted fresh-concrete pressures. Excessively high pouring rates lead to formwork overload, cause greater deflection and risk causing breakage.

Stripping the formwork

- Do not strip the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be stripped!
- When stripping the formwork, never use the crane to break concrete cohesion. Use suitable tools such as timber wedges, special pry-bars or system features such as Framax S bias-cut corners.
- When stripping the formwork, do not endanger the stability of any part of the structure, or of any scaffolding, platforms or formwork that is still in place!

Transporting, stacking and storing

- Observe all country-specific regulations applying to the handling of formwork and scaffolding. For system formwork the Doka slinging means stated in this booklet must be used – this is a mandatory requirement.
  If the type of sling is not specified in this booklet, the customer must use slinging means that are suitable for the application envisaged and that comply with the regulations.
- When lifting, always make sure that the unit to be lifted and its individual parts can absorb the forces that occur.
- Remove loose parts or secure them so that they cannot slip out of position and drop.
- When lifting formwork or formwork accessories with a crane, no persons must be carried along, e.g. on working platforms or in multi-trip packaging.
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this document!

Maintenance

- Only original Doka components may be used as spare parts. Repairs may only be carried out by the manufacturer or authorized facilities.

Miscellaneous

The weights are averages on the basis of new material. Actual weights can vary due to material tolerances. Weights can also differ on account of dirtying, moisture absorption, etc.

We reserve the right to make alterations in the interests of technical progress.

Symbols

The following symbols are used in this document:

DANGER
This is a notifier drawing attention to an extremely dangerous situation in which non-compliance with this notifier will lead to death or severe, irreversible injury.

WARNING
This is a notifier drawing attention to a dangerous situation in which non-compliance with this notifier can lead to death or severe, irreversible injury.

CAUTION
This is a notifier drawing attention to a dangerous situation in which non-compliance with this notifier can lead to slight, reversible injury.

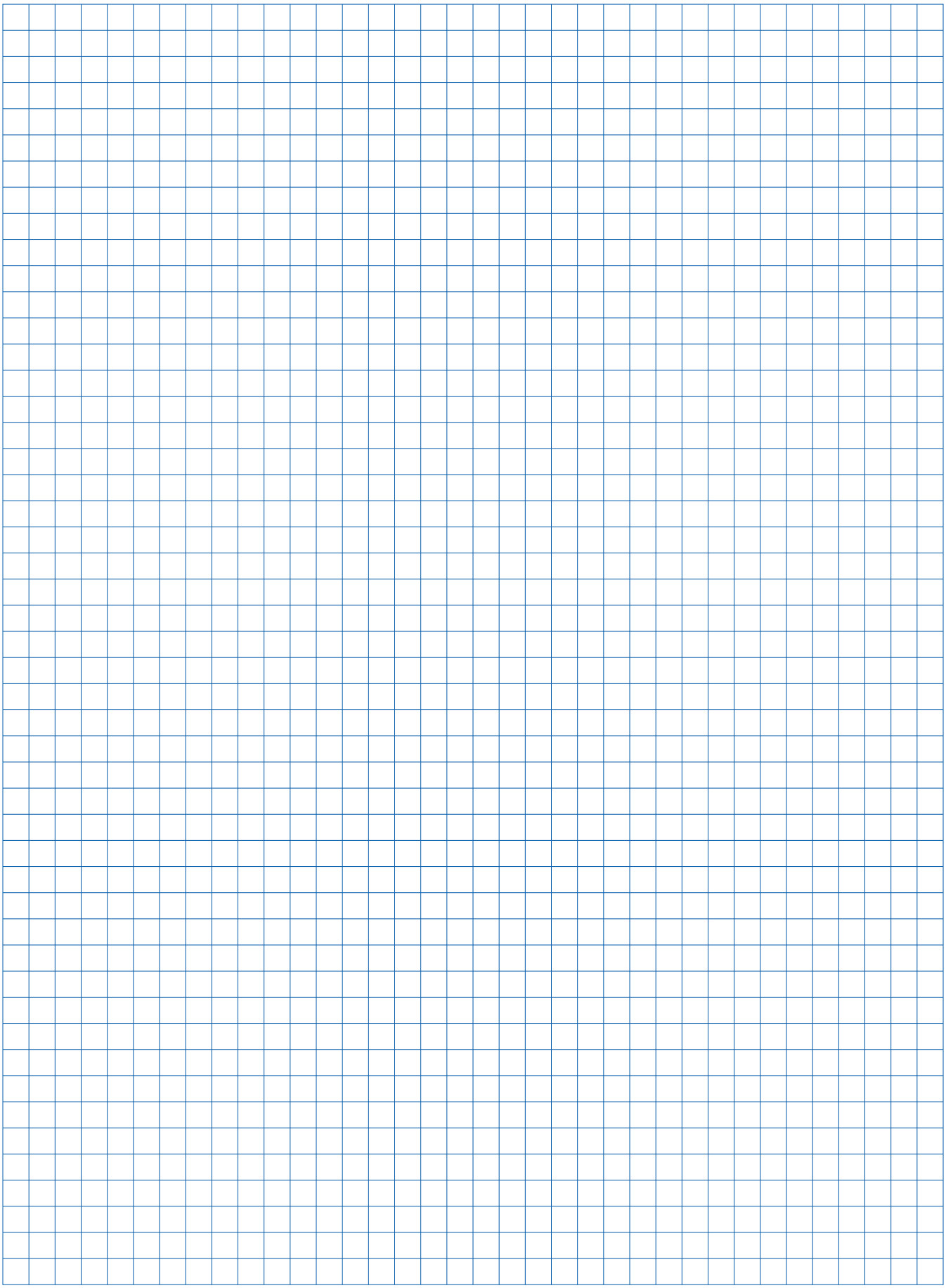
NOTE
This is a notifier drawing attention to a situation in which non-compliance with this notifier can lead to malfunctions or damage to property.

Instruction
Indicates that actions have to be performed by the user.

Visual inspection
Indicates that actions performed must be checked by means of a visual inspection.

Tip
Draws attention to a useful tip for best-practice usage.

Reference
Cross-references other documents.



System description

Dokaflex S - the versatile hand-set system for floor-slabs

Dokaflex S can easily be adapted to fit any layout, simply by telescoping the Doka H20 top beams.

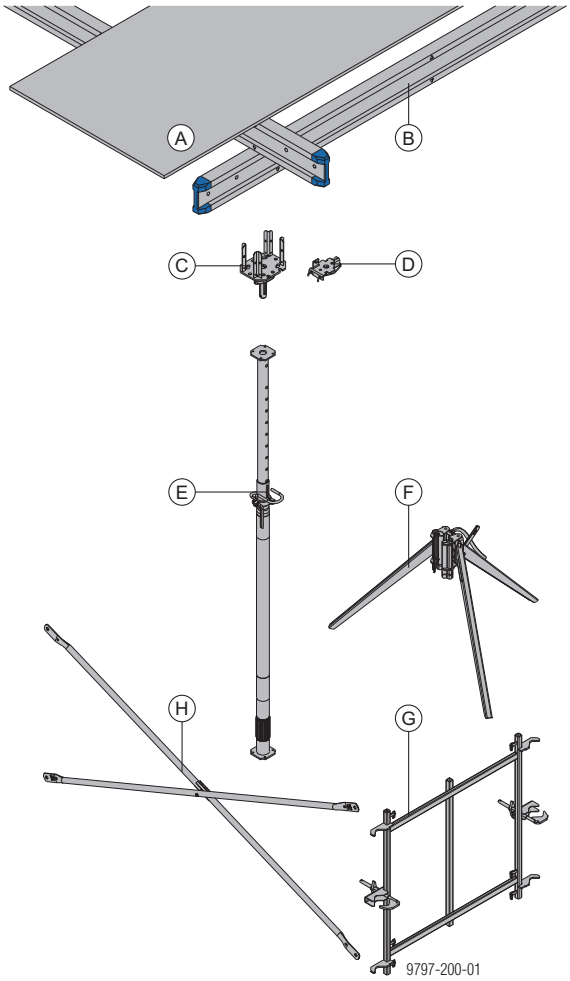
Further advantages:

- infill zones are managed within the system, making it easy to adapt to walls and columns
- for shoring-heights of up to 18’-0"
- any type of form-facing can be used

Dokaflex S is ideal for enclosed spaces where the formwork superstructure can be braced against walls on all sides.

Horizontal forces at exposed slab-edges, downturned beams or steps in ceiling slabs shall be transmitted by bracing or tie-backs.

Small number of system components - all perfectly co-ordinated



A	Structural 1 plyform 3/4"
B	Doka beam H20 top P
C	Lowering head H20
D	Supporting head H20 DF
E	Doka floor props Eurex 30 top
F	Removable folding tripod top
G	Bracing frame Eurex 4'-0" (1.22m)
H	Diagonal cross 18.200

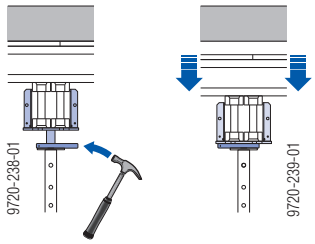
(B) Doka beam H20 top P

- easy-to-distinguish stringers (4.90m) and joists (3.30m)
- integrated shock absorbers at the beam ends for reduced damage and long service life

Follow the directions in the 'Timber formwork beams' User Information booklet!

(C) Lowering head H20

- integrated quick-lowering function for minimizing damage during stripping
- stabilizes the stringers so that these cannot tip over on their sides



(D) Supporting head H20 DF

- easy to install on the floor prop
- for fixing intermediate props to the stringer

(E) Doka floor props Eurex

Floor prop compliant with EN 1065, ACI and CSA

Type of Doka floor prop	Permitted load-bearing capacity to US standard
Eurex 20 top	6.0 kip (6000 lbs)
Eurex 30 top	8.5 kip (8500 lbs)

Their high load-bearing capacity is complemented by many practical details making them very easy to handle:

- Numbered pegging holes for easier height adjustment
- Elbowed fastening clamps, reducing the risk of injury and making the props easier to operate
- Special thread geometry makes the props easier to back off even under high load

Follow the directions in the ‘Floor props Eurex top (USA and Canada version)’ User Information booklet

Note:

The floor props can be lengthened with the Floor prop extension 0.50m (allow for the reduced load-bearing capacity).

Follow the directions in the 'Floor prop extension 0.50m' User Information booklet!

(F) Removable folding tripod top

The Removable folding tripod provides sufficient bracing while the floor props, stringers and joists are being set up in situations where the formwork superstructure is braced by walls on all sides.

- Set-up aid for floor props
- Swing-out legs offer flexibility for placement where space is at a premium, for example close to walls and in corners

CAUTION

The Removable folding tripod is not a substitute for the bracing necessary for load-bearing towers.

➤ Use as a set-up aid only!

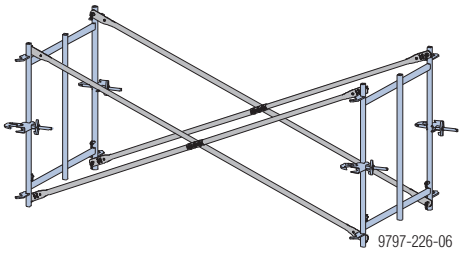
(G) Bracing frame Eurex 4'-0" (1.22m) + (H) Diagonal cross 18.200

Bracing frames 4’-0" (1.22m) are joined with diagonal crosses to make a bracing tower.

- diagonal crosses are easy to attach, with safety catches

On exposed slab-edges, two bracing towers are used to create a stable staging area:

- for setting up the formwork safely beside exposed slab-edges
- for creating a stable placement area on which the stacks of plyform sheets needed for formwork set-up can safely be placed



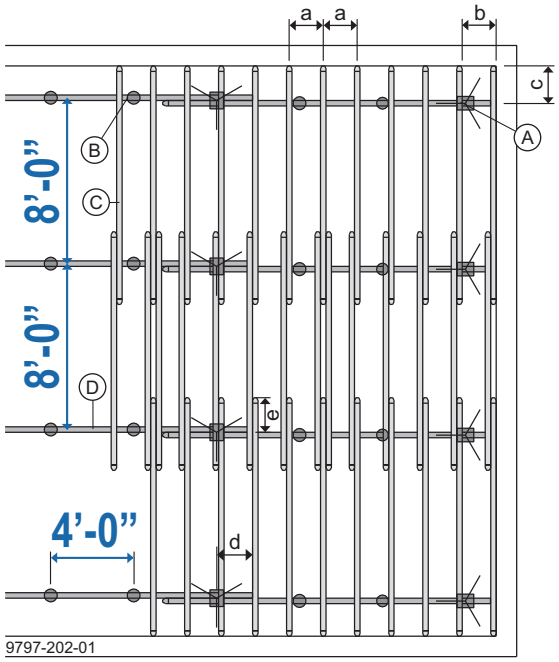
Note:

Not suitable for sustaining horizontal loads during pouring.

System logic for all floor-slabs up to 10" thick

Spacing and positions of the component parts

- max. prop spacing: 4'-0"
- max. stringer spacing: 8'-0"



a ... 19.2" joist spacing
b ... 20" cantilever stringer
c ... 20" cantilever joist
d ... ≥ 12" stringer overlap
e ... ≥ 20" cantilevered length of joists (measured from the stringer axis)

A	Floor prop Eurex + Lowering head H20 + Removable folding tripod
B	Floor prop Eurex + Supporting head H20 DF
C	Doka beam H20 top P 3.30m (joist)
D	Doka beam H20 top P 4.90m (stringer)

Stringers and joists

The **4.90m** long **Doka beam H20 top P** is used as a **stringer**, and the **3.30m** long beam as a **joist**.

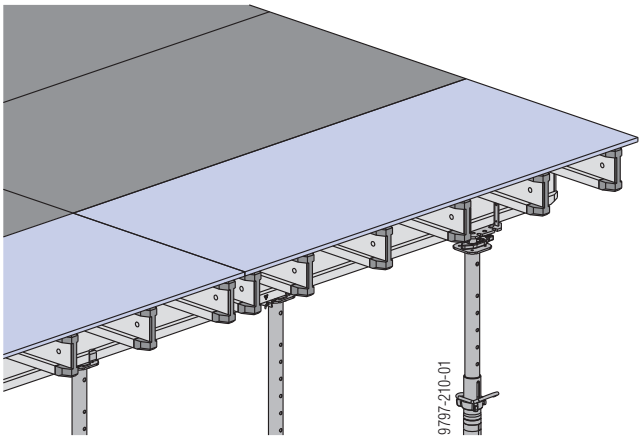
Format of the formwork sheets

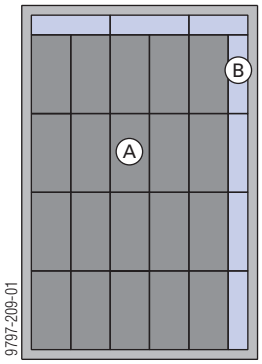
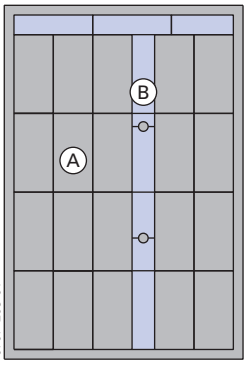
Standard 4’-0" x 8’-0" format sheets have just the right dimensions to fit exactly into the increment-grid of the Dokaflex S system.

Adaptability

Fillers and adjustments

Infill zones are solved within the system - with no special accessories needed. The necessary adaptation is made by **overlapping the Doka beams** and **inserting strips of formwork sheeting**.



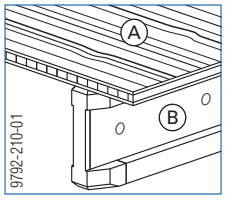
Adaptation along edge	Adaptation around columns
	

A Formwork sheet

B Fitting boards in the closure zone

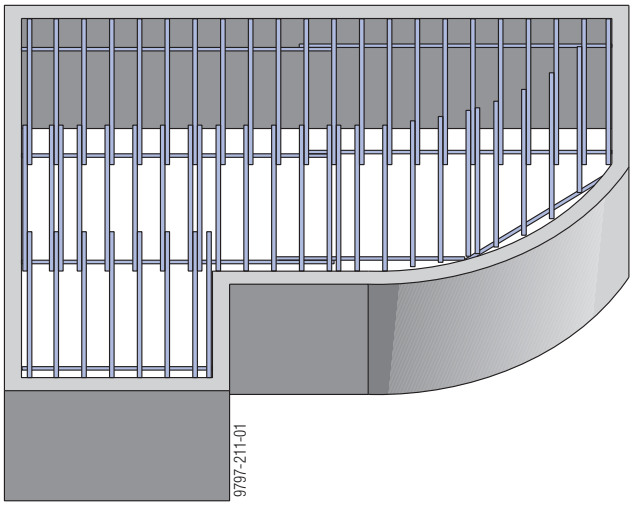
NOTICE

The grain of the face layer **(A)** must run at right angles to the supports **(B)** .



Grid and flexibility - in one system

Dokaflex S also adapts to difficult layouts.



Instructions for assembly and use

NOTICE

When carrying a floor prop, grip it only by the outer tube and the inner tube.

NOTICE

As well as the instructions given here, the section headed 'Shoring system, reshoring, concrete technology and stripping' MUST be followed.

NOTICE

Windproofing

- For increased stability, in larger rooms, the full erection sequence of stringers + joists + formwork sheets should be carried out progressively for successive sub-areas of the room.
  When doing this, provide suitable bracing to existing parts of the structure (e.g. walls or columns).
- If there is any risk of the formwork being blown over, all free-standing, non-enclosed areas of slab formwork shall be secured during work-breaks and when work finishes for the day.

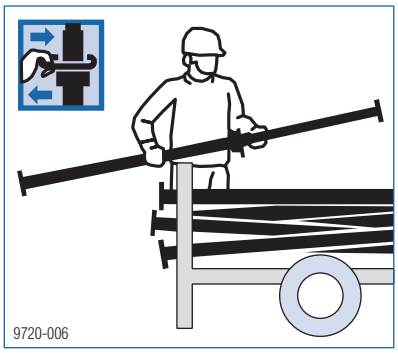
Setting up the formwork in enclosed rooms

Setting up the floor props

➤ System logic for all floor-slabs up to 10" thick: Lay the stringers and joists down on the ground, along the walls.
Maximum spacings:
- 8'-0" for stringers
- 12'-0" for props with Removable folding tripods
(final prop spacing after installation of the intermediate props: 4'-0")

➤ If spacing is in accordance with the information in the section headed 'Structural design': Measure up the positions of the floor props.

➤ Roughly adjust the height of the floor prop, using the fastening clamp.



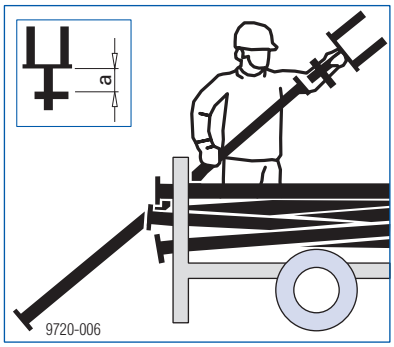
- The fastening clamp **(A)** has to be pushed all the way into the floor prop.
- Turn the adjusting nut **(B)** until it is in contact with the fastening clamp.

The holes are all numbered, which makes it easier to adjust the props to the same height.

CAUTION

➤ If you do transport the floor props with the lowering heads still attached, secure the heads with Spring locked connecting pins 16mm to prevent them dropping out. This is particularly important when they are transported in the horizontal.

➤ Insert a Lowering head H20 into the floor prop. Leave the correct amount of lowering play (a)!



Clearance **a** between wedge and head plate: $2^1/_4$"

➤ Set up each Removable folding tripod.

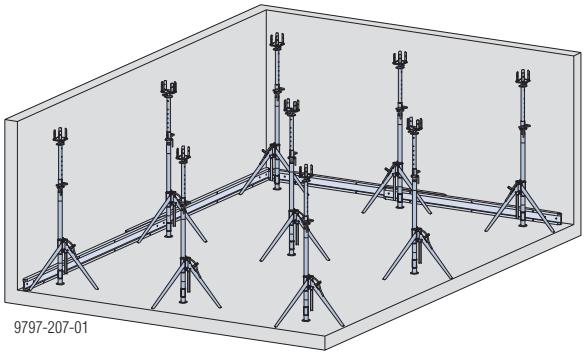
NOTICE

➤ Do not oil or grease wedge-clamped joints.

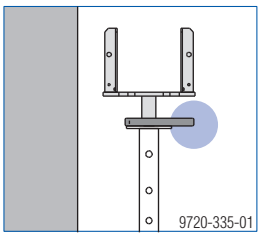
➤ Put the floor prop into the tripod and fix it in place with the clamping lever.
Before anybody steps onto the formwork, check again to make sure that the props have been correctly secured.

Setting up tripods in corners or against walls

If it is not possible to completely unfold the legs of the tripod – e.g. at the edges of a structure or at floor breakthroughs etc. – we recommend fastening this tripod to an adjacent floor prop instead, where there is room for the legs to be completely unfolded.



The lowering heads that will be under the stringers next to the walls must be turned inwards so that they can be knocked undone when the time comes to take down the formwork.



Inserting the stringers

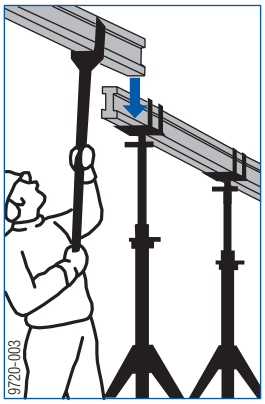
The lowering heads can hold both single beams (on edge-of-room props) and double beams (at overlaps).

WARNING

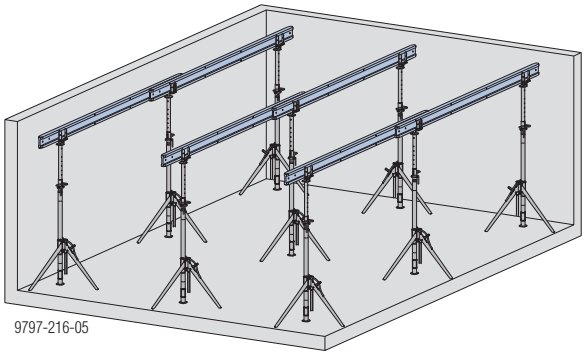
Loads that are applied non-centrally can cause overloading of the system.

➤ Ensure that all loads are applied centrally!

➤ Using beam forks, place the stringers into the lowering heads.



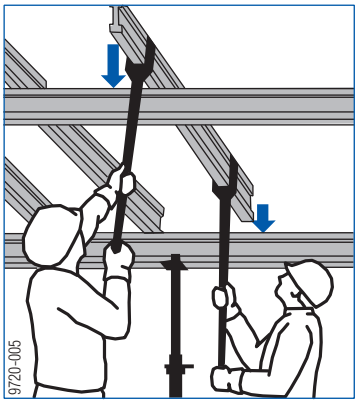
➤ Adjust the stringers to the correct room height.



- Lumber can be attached to the floor props as diagonal braces, using the Bracing clamp B.
- Bracing frame Eurex 4’-0" (1.22m) can also be used as a set-up aid.

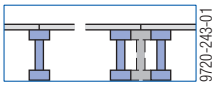
Placing the joists

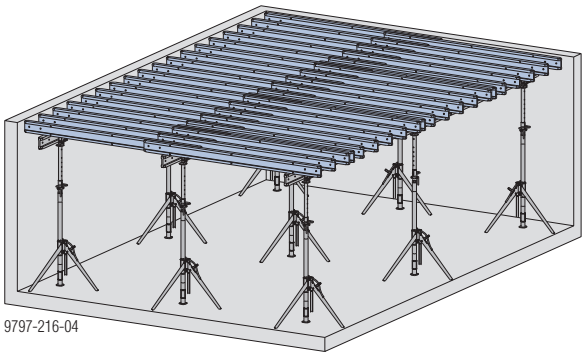
➤ Use the beam forks to place the joists in position, with an overlap.



Maximum center-to-center spacing of joists: 19,2" (if permissible - see the section headed ‘Structural design’)

Place a beam (or double beam) wherever there is to be a joint between the panels.





Installing the intermediate props

NOTICE

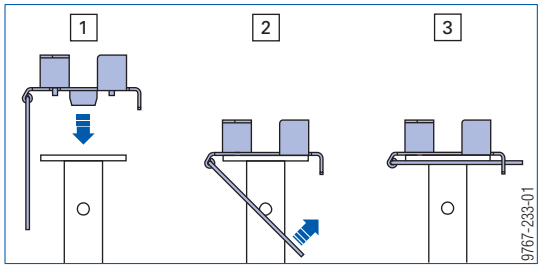
➤ Install the intermediate props so that they force-fit. When the installation sequence as stated here is adhered to, it is enough to hand-tighten the props against the bottom flange.

➤ Make sure that the Supporting head H20 DF is correctly screwed up against the bottom flange.

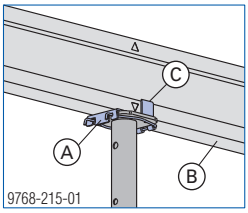
➤ Setting individual intermediate props higher than others is not permitted!

➤ Additional securing of the intermediate prop with double-headed nail 6d through the hole in the supporting head is optional.

➤ Place the Supporting head H20 DF on the floor prop and secure it with the integral spring-steel stirrup.

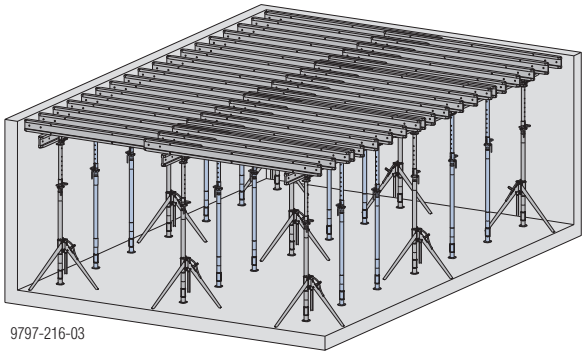


➤ Install the intermediate props.



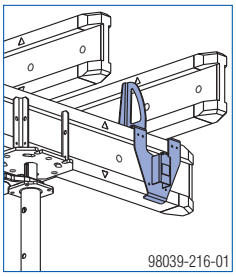
A	Supporting head H20 DF
B	Doka beam H20
C	Hole in the supporting head (for fixing with double-headed nails 6d)

Maximum spacing of the props: 4'-0"



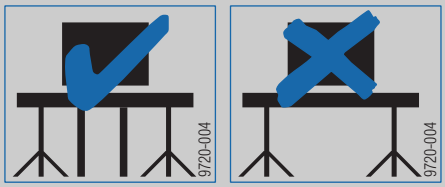
Laying the plywood sheets

To prevent the joists tipping on their sides while the sheets are being laid on them, joist stabilizers can be used.



WARNING

- Before anyone steps onto the surface of the slab formwork, its stability must be ensured (for example with Bracing frames Eurex, bracing or tie-backs).
- It is not permitted to set down loads on the floor-slab formwork (e.g. beams, formwork sheets, reinforcement steel) until after the intermediate props have been set up and adequate stability has been established!
- Transfer of horizontal loads must be ensured by other measures (e.g. by transferring these loads into the structure or using tie-backs or bracing). Follow the instructions in the section headed 'Horizontal loads during pouring'.



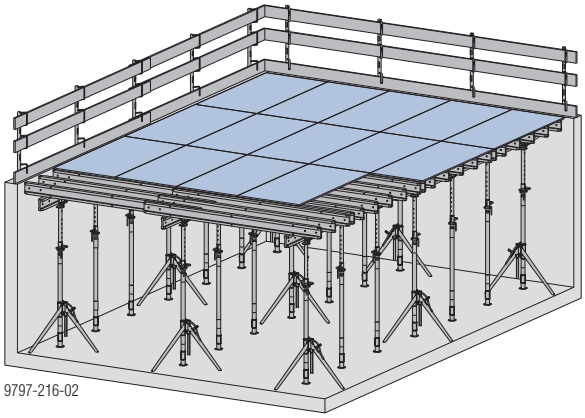
NOTICE

- Use personal fall-arrest systems to protect against fall hazards when working on unsecured slab-edges (e.g. safety harness).

- Lay the formwork sheets (grain at right angles to the joists).

Where necessary (e.g. edge zones), secure the formwork sheet with 6d nails.

- Install fall protection around all exposed edges.
- Spray the formwork sheets with release agent.



Setting up the formwork in open rooms

Pre-assembling cells

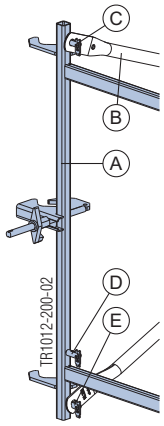
On exposed slab-edges, two bracing towers are used to create a stable staging area:

- for setting up the formwork safely beside exposed slab-edges
- for creating a stable placement area on which the stacks of plywood sheets needed for formwork set-up can safely be placed

NOTICE

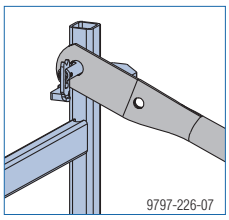
➤ Always set up the bracing frames such that the end with the two safety catches **(D)** and **(E)** is at the bottom.

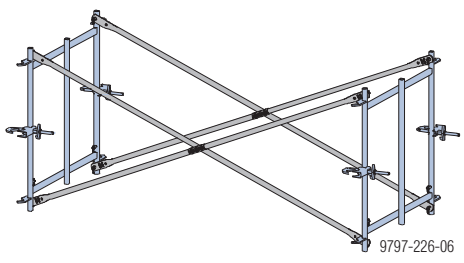
➤ Join the two frames with diagonal crosses at top and bottom.



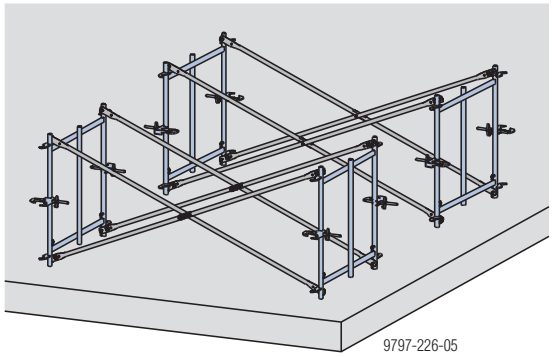
A	Bracing frame Eurex 4'-0" (1.22m)
B	Diagonal cross
C	Safety catch 1
D	Safety catch 2
E	Safety catch 3

➤ Slide the diagonal cross on to the latch-type pegs, and immediately secure it with the safety catches.





➤ Set up the second bracing tower in the same way, a suitable distance from the first one.



Max. area of formwork per staging area: 1000 ft²

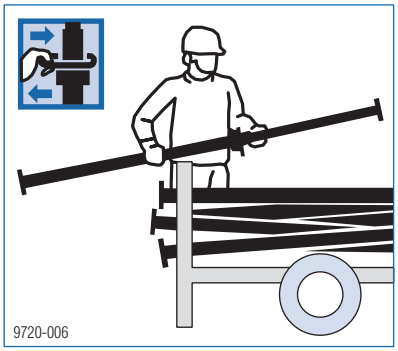
Note:

The horizontal forces occurring during pouring have to be transferred by bracing or tie-backs.

If this bracing is attached before the formwork sheets are laid on the beams, only one staging area is needed at the start of formwork set-up.

Setting up the floor props

➤ Roughly adjust the height of the floor prop, using the fastening clamp.



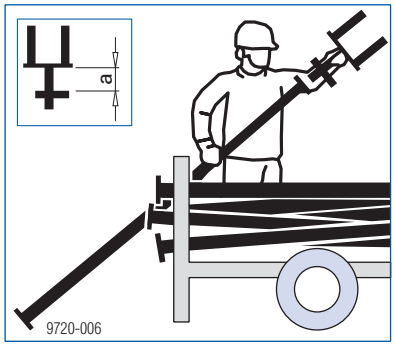
- The fastening clamp **(A)** has to be pushed all the way into the floor prop.
- Turn the adjusting nut **(B)** until it is in contact with the fastening clamp.

The holes are all numbered, which makes it easier to adjust the props to the same height.

CAUTION

➤ If you do transport the floor props with the lowering heads still attached, secure the heads with Spring locked connecting pins 16mm to prevent them dropping out. This is particularly important when they are transported in the horizontal.

➤ Insert a Lowering head H20 into the floor prop. Leave the correct amount of lowering play (a)!

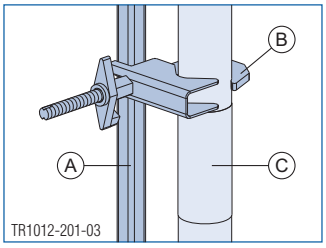


Clearance **a** between wedge and head plate: $2^1/_4$"

NOTICE

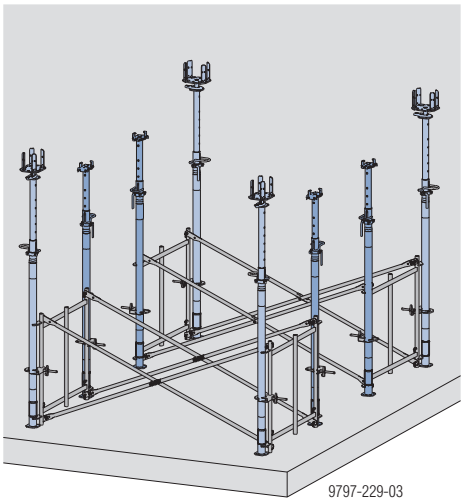
➤ Do not oil or grease wedge-clamped joints.

➤ Secure the floor prop to the bracing frame with the quick-fixing mechanism.
Before anybody steps onto the formwork, check again to make sure that the props have been correctly secured.



A Bracing frame Eurex 4'-0" (1.22m)
B Prop holder with quick-connect mechanism
C Doka floor prop Eurex

➤ Secure floor props with a Supporting head H20 DF to the inside quick-connect mechanisms (see the section headed 'Installing the intermediate props').



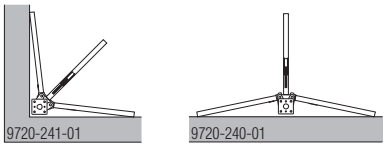
Do not adjust the inside props to the right height until the stringers have been laid in place.

This staging area can withstand vertical and horizontal loads corresponding to the loads imposed by two persons and one stack of formwork sheets.

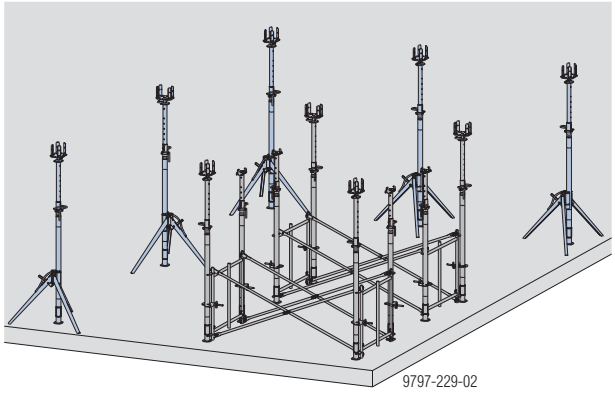
➤ Position the Removable folding tripod outside the staging area.

➤ Put the floor prop into the tripod and fix it in place with the clamping lever.
Before anybody steps onto the formwork, check again to make sure that the props have been correctly secured.

Setting up tripods in corners or against walls



If it is not possible to completely unfold the legs of the tripod – e.g. at the edges of a structure or at floor breakthroughs etc. – we recommend fastening this tripod to an adjacent floor prop instead, where there is room for the legs to be completely unfolded.



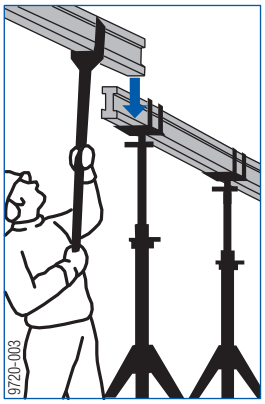
Inserting the stringers

The lowering heads can hold both single beams (on edge-of-room props) and double beams (at overlaps).

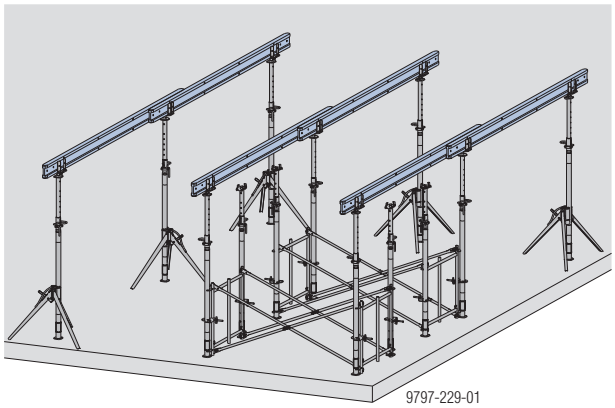
WARNING
Loads that are applied non-centrally can cause overloading of the system.

➤ Ensure that all loads are applied centrally!

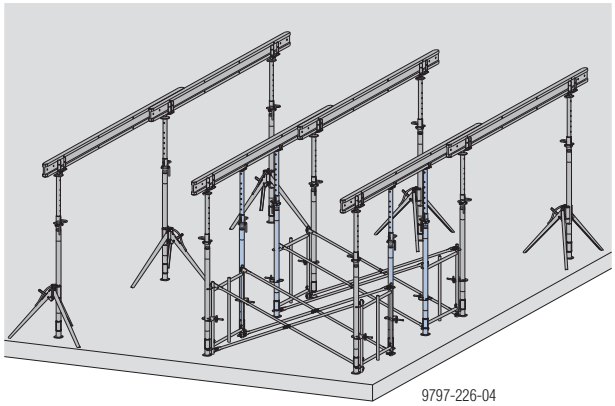
➤ Using beam forks, place the stringers into the lowering heads.



➤ Adjust the stringers to the correct room height.



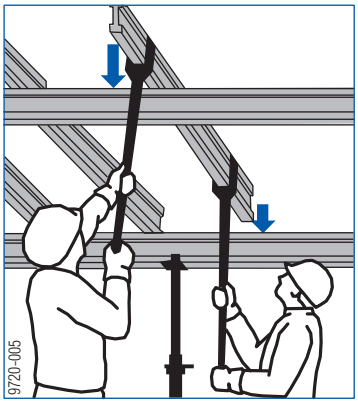
➤ Adjust the inside props on the bracing frames to the right height.



- Lumber can be attached to the floor props as diagonal braces, using the Bracing clamp B.
- Bracing frame Eurex 4’-0" (1.22m) can also be used as a set-up aid.

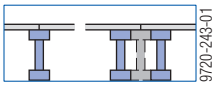
Placing the joists

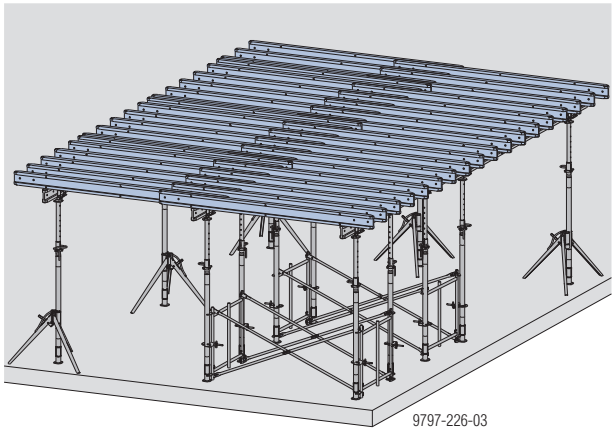
➤ Use the beam forks to place the joists in position, with an overlap.



Maximum center-to-center spacing of joists: 19,2" (if permissible - see the section headed ‘Structural design’)

Place a beam (or double beam) wherever there is to be a joint between the panels.





Installing the intermediate props

NOTICE

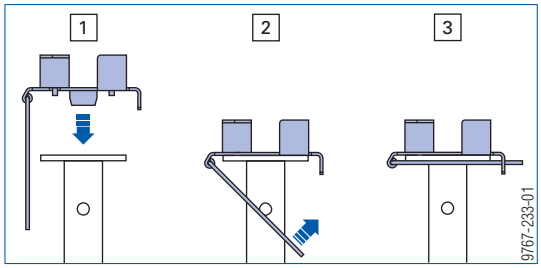
➤ Install the intermediate props so that they force-fit. When the installation sequence as stated here is adhered to, it is enough to hand-tighten the props against the bottom flange.

➤ Make sure that the Supporting head H20 DF is correctly screwed up against the bottom flange.

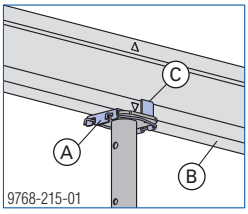
➤ Setting individual intermediate props higher than others is not permitted!

➤ Additional securing of the intermediate prop with double-headed nail 6d through the hole in the supporting head is optional.

➤ Place the Supporting head H20 DF on the floor prop and secure it with the integral spring-steel stirrup.

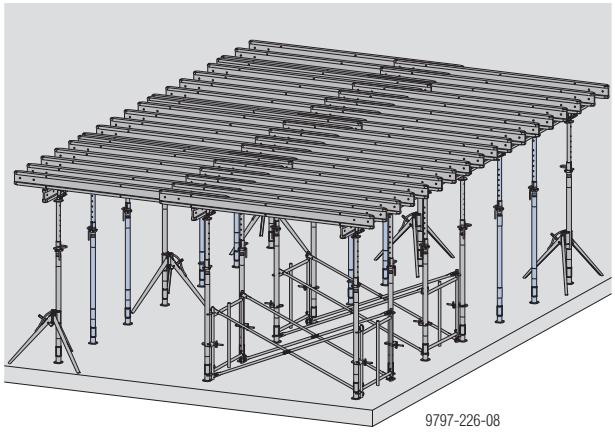


➤ Install the intermediate props.



A Supporting head H20 DF
B Doka beam H20
C Hole in the supporting head (for fixing with double-headed nails 6d)

Maximum spacing of the props: 4'-0"



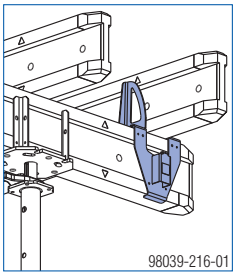
Installing the bracing

Horizontal forces at exposed slab-edges, downturned beams or steps in ceiling slabs must be restrained by bracing or tie-backs.

➤ Fix rough-cut 1"x4" or 2"x4" lumber to the floor props using Bracing clamps B.
The lumber must be arranged at a 30° angle to the previously cast slab. The top end of the plank must be pointing towards the edge of the floor-slab.

Laying the plywood sheets

To prevent the joists tipping on their sides while the sheets are being laid on them, joist stabilizers can be used.

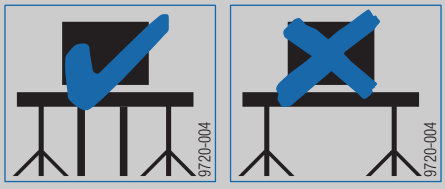


WARNING

➤ Before anyone steps onto the surface of the slab formwork, its stability must be ensured (for example with Bracing frames Eurex, bracing or tie-backs).

➤ It is not permitted to set down loads on the floor-slab formwork (e.g. beams, formwork sheets, reinforcement steel) until after the intermediate props have been set up and adequate stability has been established!

➤ Transfer of horizontal loads must be ensured by other measures (e.g. by transferring these loads into the structure or using tie-backs or bracing). Follow the instructions in the section headed 'Horizontal loads during pouring'.



NOTICE

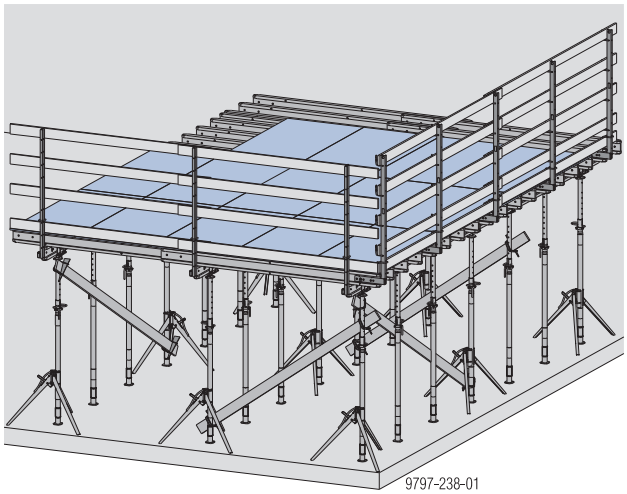
➤ Use personal fall-arrest systems to protect against fall hazards when working on unsecured slab-edges (e.g. safety harness).

➤ Lay the formwork sheets (grain at right angles to the joists).

Where necessary (e.g. edge zones), secure the formwork sheet with 6d nails.

➤ Install fall protection around all exposed edges.

➤ Spray the formwork sheets with release agent.



Use at high floor-to-slab heights

WARNING

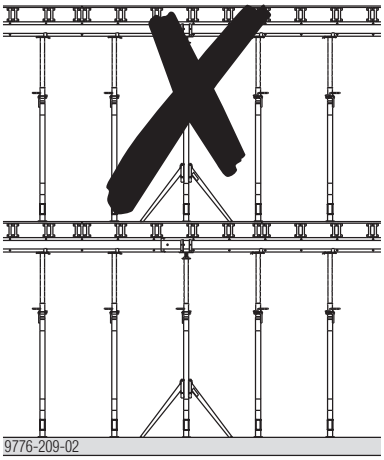
Stacked Dokaflex configurations lack stability!

Stacked Dokaflex can lead to collapse and consequently these configurations are prohibited.

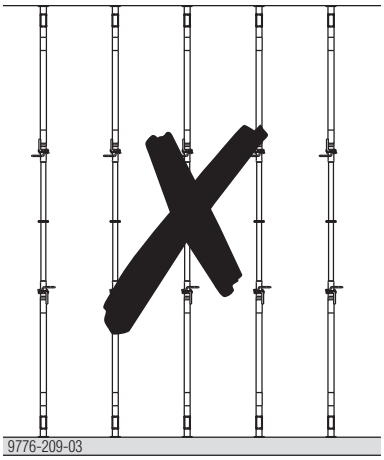
Connecting floor props one on top of another is also prohibited.

➤ Use floor props of adequate length or load-bearing towers as propping.

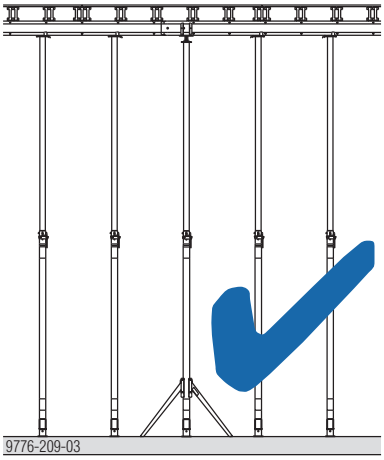
Stacked Dokaflex



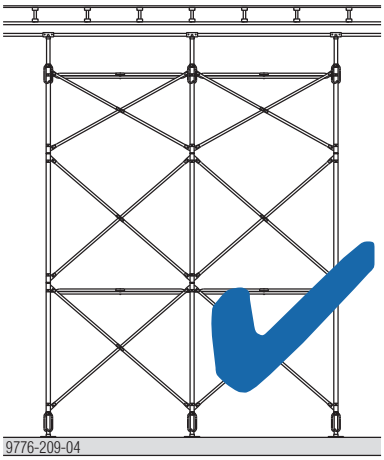
Floor props set one on top of another



Floor props of adequate length



Shoring tower



Pouring

➤ Before pouring, check the floor props once again.

- The fastening clamp **(A)** has to be pushed all the way into the floor prop.
- Turn the adjusting nut **(B)** until it is in contact with the fastening clamp.

To protect the surface of the plywood-facing, we recommend using a vibrator with a protective rubber cap.

Follow the directions in the section headed 'Structural design'.

Stripping the formwork

NOTICE

Observe the stipulated stripping times.

Concremote provides reliable, standards-compliant information on the strength development of concrete on the site, in real-time.

Follow the directions in the ‘Concremote’ User Information booklet.

Note:

For further information, see the section headed 'Shoring system, reshoring, concrete technology and stripping'.

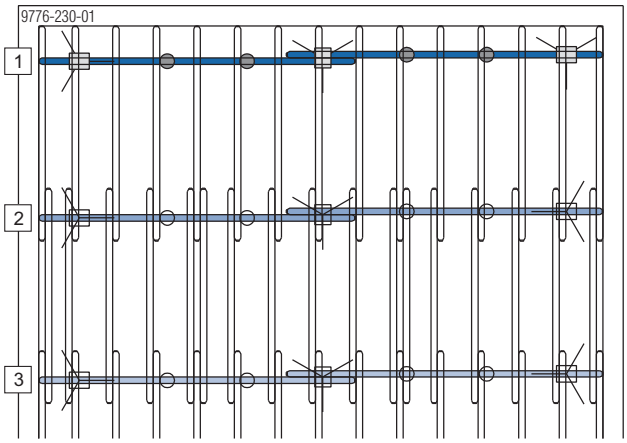
Lowering the floor-slab formwork

NOTICE

The basic rule is:

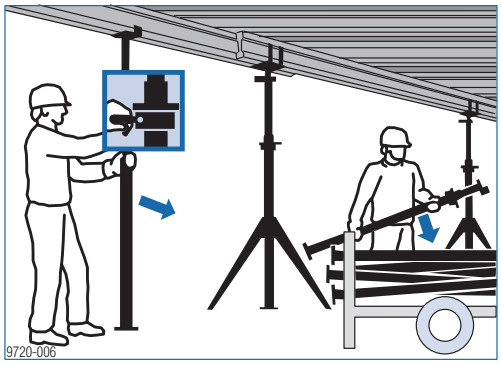
- Stress-release the floor props row by row.
- Stress-release shall **always be carried out working from one side toward the other, or from the middle of the floor-slab (mid-span) toward the slab edges**.

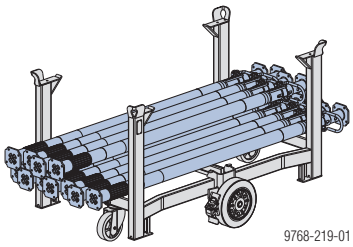
  It is imperative to adopt this procedure for wide spans!
- **Do not under any circumstances attempt stress release from both sides toward the middle**!



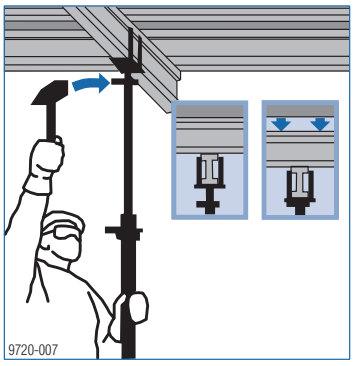
Stress-releasing the first row

➤ Remove the intermediate props and put them in the stacking pallet.





➤ Lower the floor-slab formwork by hitting the wedge on the lowering head with a hammer.

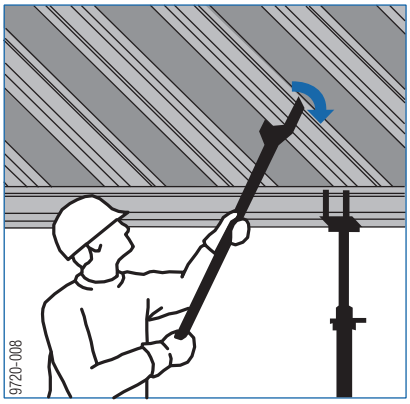


Stress-releasing next rows

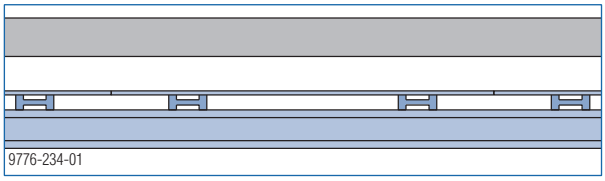
➤ Stress-release the next rows one after the other in the same way.

Removing parts that are no longer needed

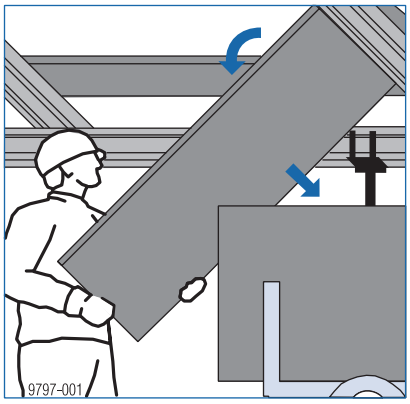
➤ Turn the joists on to their sides, pull them out and put them in the stacking pallet.



➤ Leave enough beams in position to secure the plywood sheets.



➤ Remove the plywood sheets and put them in the stacking pallet.



➤ Remove the remaining joists and the stringers, and put them in the stacking pallet.

Removing the floor props

➤ Turn the floor prop to the horizontal position.

➤ If necessary, open the fastening clamp and push the inner tube into the outer tube.

➤ Put the Removable folding tripods and floor props in the stacking pallet.

It is better to transport the floor props and the lowering heads separately (the floor props on their own can be stored much more space-savingly in the stacking pallet).

Reshoring

➤ Before pouring the next floor-slab (i.e. above the one that has just been stripped), install reshoring props.

Note:

For further information (number of props etc.), see the section headed 'Shoring system, reshoring, concrete technology and stripping'.

Structural design

The data-tables make allowance for the following:

- service load and weight of formwork: 50 psf
- max. mid-span deflection: l/360 or 1/4" (without service load)
- 2.5:1 safety factor

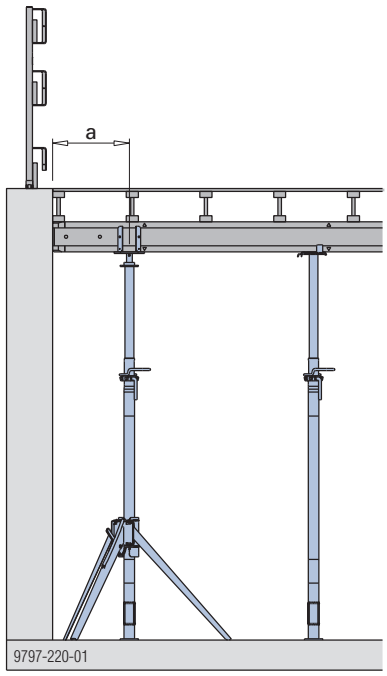
Dokaflex S data-table for interior application

Note:
For slab thicknesses greater than 18", consult your Doka technician.

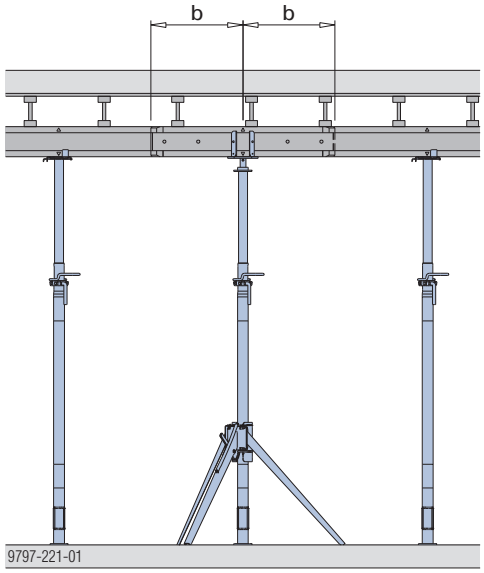
Timber formwork beams H20

Slab thickness	Joist spacing of sanded grades of class-1 plywood, with face grain parallel to span		Permitted prop spacing for the selected stringer spacing of								
	5/8"	3/4"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"
6"	19.2"	19.2"	—	—	—	—	—	4'-11"	4'-8"	4'-6"	4'-4"
7"	19.2"	19.2"	—	—	—	5'-0"	4'-9"	4'-7"	4'-4"	4'-2"	4'-0"
7 1/2"	19.2"	19.2"	—	—	—	4'-10"	4'-7"	4'-5"	4'-3"	4'-0"	3'-8"
8"	19.2"	19.2"	—	—	4'-10"	4'-7"	4'-5"	4'-3"	4'-0"	3'-8"	3'-2"
9"	19.2"	19.2"	—	4'-11"	4'-8"	4'-5"	4'-3"	4'-0"	3'-8"	3'-3"	2'-9"[1]
10"	19.2"	19.2"	4'-11"	4'-8"	4'-5"	4'-2"	4'-0"	3'-7"	3'-1"	2'-6"	—
10 1/2"	19.2"	19.2"	4'-9"	4'-6"	4'-3"	4'-0"	3'-7"	3'-0"	2'-3"	—	—
12"	19.2"	19.2"	4'-6"	4'-3"	4'-0"	3'-6"	2'-11"	—	—	—	—
13"	19.2"	19.2"	4'-3"	4'-0"	3'-7"	2'-11"	—	—	—	—	—
14 1/2"	16.0"	19.2"	4'-0"	3'-6"	2'-10"	—	—	—	—	—	—
15"	16.0"	19.2"	3'-10"	3'-3"	2'-6"	—	—	—	—	—	—
16"	16.0"	19.2"	3'-6"	2'-9"	—	—	—	—	—	—	—
18"	12.0"	19.2"	2'-7"	—	—	—	—	—	—	—	—

[1] max. spacing of joists 16"



a ... 20"



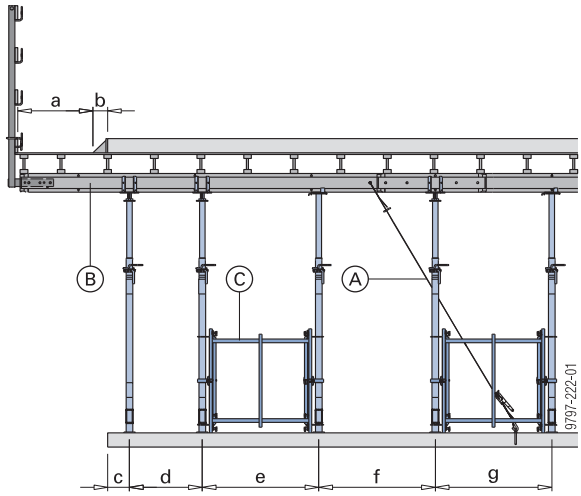
b ... 24" (min. 20")

Dokaflex S data-table for perimeter application with stringers perpendicular to slab edge

Note:

- For slab thicknesses greater than 18", consult your Doka technician.
- For the sake of more clarity, all the requirements relating to bracing are not included here. Contractor shall provide bracing or tie-backs as required for horizontal loads. Observe the instructions given in the section headed ‘Horizontal loads’.

Slab thickness	Solution for perimeter application for a pre-selected stringer spacing of								
	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"
6"	—	—	—	—	—	S1	S1	S1	S2
7"	—	—	—	S1	S1	S1	S1	S2	S7
7 1/2"	—	—	—	S1	S1	S1	S2	S3	S7
8"	—	—	S1	S1	S1	S1	S3	S6	—
9"	—	S1	S1	S1	S2	S3	S4	S6	—
10"	S1	S1	S1	S2	S4	S4	S4	—	—
10 1/2"	S1	S1	S1	S3	S4	S4	S4	—	—
12"	S1	S2	S3	S4	S4	—	—	—	—
13"	S1	S3	S4	S4	—	—	—	—	—
14 1/2"	S3	S4	S4	—	—	—	—	—	—
15"	S4	S4	S5	—	—	—	—	—	—
16"	S4	S4	—	—	—	—	—	—	—
18"	S4	—	—	—	—	—	—	—	—



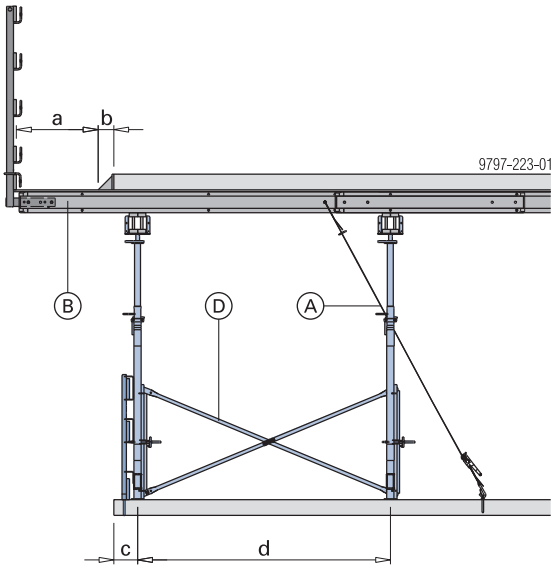
A Lashing strap 5.00m
B Doka beam H20 top P 4.90m
C Bracing frame Eurex 1.22m

	a	b	c	d	e	f	g
S1	2'-6"	6"	9"	2'-6"	4'-0"	4'-0"	—
S2				3'-0"	4'-0"	3'-6"	—
S3				2'-0"	3'-6"	4'-0"	—
S4				2'-0"	3'-4"	2'-6"	—
S5				1'-3"	3'-3"	1'-7"	3'-8"
S6				1'-9"	3'-6"	2'-7"	—
S7				1'-6"	3'-9"	2'-7"	—

Perimeter application with stringers parallel to slab edge

Note:

- For slab thicknesses greater than 12", consult your Doka technician.
- For the sake of more clarity, all the requirements relating to bracing are not included here. Contractor shall provide bracing or tie-backs as required for horizontal loads. Observe the instructions given in the section headed ‘Horizontal loads’.



a ... 2’-6"
b ... 6"
c ... 9"
d ... 8'-0"

A Lashing strap 5.00m
B Doka beam H20 top P 4.90m
D Diagonal cross 18.200

Horizontal loads

During pouring

Using Dokaflex S on edge zones

If no separate edge tables are available, the following points shall be taken into account when Dokaflex S is used:

- Horizontal forces shall be transferred by means of bracing or tie-backs, and can also be transferred into existing parts of the structure, such as concrete columns or walls.
- A force-locked superstructure is necessary in order for the horizontal forces to be transferred.

Note:

At center-to-center distances of 16’ or less between concrete columns, bracing is not necessary if the horizontal forces are transferred to existing parts of the structure and the formwork sheeting is nailed in accordance with the standard.

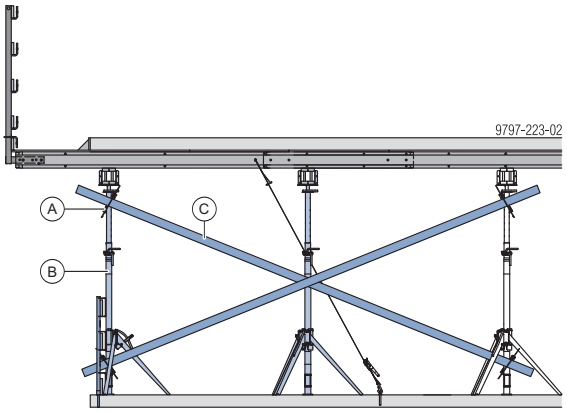
WARNING

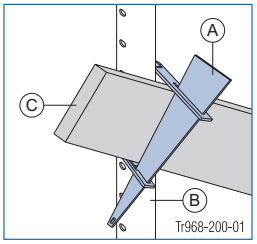
- ➤ Secure cantilevering slab formwork to prevent lift-out and tipover.
- ➤ Joists with bulkheads must be secured against horizontal pull-out.

Lumber can be attached to the floor props as diagonal braces, using the Bracing clamp B.

NOTICE

- Always hammer in the wedge from top to bottom!
- Always install 2 crossed planks on each side.





A	Bracing clamp B
B	Doka floor prop
C	Plank (by site)

Possible clamping ranges for planks and Bracing clamps B

	Plank							
	1x4 3/4" x 3 1/2" (1.9 x 8.9 cm)		**1x6** 3/4" x 5 1/2" (1.9 x 14.0 cm)		**2x4** 1 1/2" x 3 1/2" (3.8 x 8.9 cm)		**2x6** 1 1/2" x 5 1/2" (3.8 x 14.0 cm)	
Floor prop	Outer tube	Inner tube	Outer tube	Inner tube	Outer tube	Inner tube	Outer tube	Inner tube
Eurex 30 top 250	—	—	—	—	✓	✓	✓	✓
Eurex 30 top 300	✓	—	✓	—	✓	✓	✓	✓
Eurex 30 top 350	✓	—	✓	—	✓	✓	✓	✓
Eurex 30 top 400	✓	✓	✓	✓	✓	✓	✓	✓
Eurex 30 top 450	✓	✓	✓	✓	✓	✓	✓	✓
Eurex 20 top 550	✓	✓	✓	✓	✓	✓	✓	✓

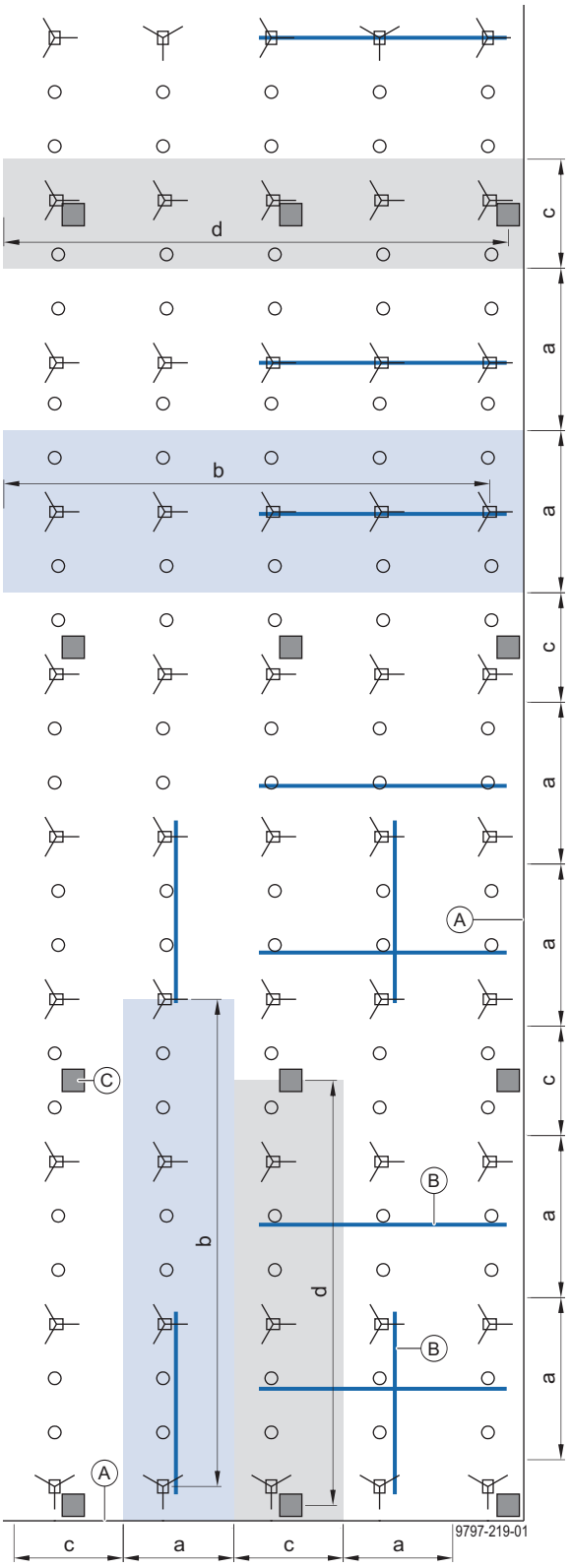
Use of bracing chart

1. If the influence widths are not stated in the table but are within the table limits, the values for influence width can be interpolated. The ‘a’ values refer to a single row of stringers or row of joists, as applicable, and the ‘c’ values refer to a row of concrete columns.
2. The ‘b’ values refer to an area without concrete columns, the ‘d’ values refer to an area with concrete columns.
3. In the table, select the row with the appropriate slab thickness. The ‘b’ value in this row corresponds to the center-to-center spacing of the bracing in the stringer or joist direction, as applicable, that enables the horizontal forces to be sustained.
4. Then select the appropriate width of the concrete column parallel to the slab edge. The ‘d’ values in this table row correspond to the maximum permitted center-to-center distance of the concrete columns along the entire influence width at which the horizontal forces occurring can be transferred to the concrete columns.
5. If the width of the concrete columns is not included in the table, select the next smaller width.

Bracing chart

Slab thick-ness			Influence width (a or c) 16'	12'	8'
6"	Bracing *)		b = 24'	b = 32'	b = 48'
	Width of the concrete column parallel to the slab edge:	10"	d = 48'	d = 64'	d = 96'
		12"	d = 56'	d = 76'	d = 116'
		14"	d = 68'	d = 88'	d = 136'
		16"	d = 76'	d = 104'	d = 156'
		18"	d = 84'	d = 116'	d = 172'
8"	Bracing *)		b = 20'	b = 24'	b = 40'
	Width of the concrete column parallel to the slab edge:	10"	d = 40'	d = 52'	d = 80'
		12"	d = 48'	d = 64'	d = 96'
		14"	d = 56'	d = 76'	d = 112'
		16"	d = 64'	d = 84'	d = 128'
		18"	d = 72'	d = 96'	d = 144'
9"	Bracing *)		b = 16'	b = 24'	b = 36'
	Width of the concrete column parallel to the slab edge:	10"	d = 36'	d = 48'	d = 72'
		12"	d = 44'	d = 60'	d = 88'
		14"	d = 52'	d = 68'	d = 104'
		16"	d = 60'	d = 80'	d = 120'
		18"	d = 68'	d = 88'	d = 136'
10"	Bracing *)		b = 16'	b = 20'	b = 32'
	Width of the concrete column parallel to the slab edge:	10"	d = 32'	d = 44'	d = 68'
		12"	d = 40'	d = 56'	d = 84'
		14"	d = 48'	d = 64'	d = 96'
		16"	d = 56'	d = 72'	d = 112'
		18"	d = 60'	d = 84'	d = 124'
12"	Bracing *)		b = 12'	b = 20'	b = 28'
	Width of the concrete column parallel to the slab edge:	12"	d = 36'	d = 48'	d = 72'
		16"	d = 48'	d = 64'	d = 96'
		20"	d = 60'	d = 80'	d = 124'
		24"	d = 72'	d = 96'	d = 148'
		28"	d = 84'	d = 112'	d = 172'
14"	Bracing *)		b = 12'	b = 16'	b = 24'
	Width of the concrete column parallel to the slab edge:	12"	d = 32'	d = 44'	d = 64'
		16"	d = 44'	d = 56'	d = 88'
		20"	d = 52'	d = 72'	d = 108'
		24"	d = 64'	d = 88'	d = 132'
		28"	d = 76'	d = 100'	d = 152'
16"	Bracing *)		b = 12'	b = 16'	b = 24'
	Width of the concrete column parallel to the slab edge:	12"	d = 28'	d = 36'	d = 56'
		16"	d = 36'	d = 52'	d = 76'
		20"	d = 48'	d = 64'	d = 96'
		24"	d = 56'	d = 76'	d = 116'
		28"	d = 68'	d = 92'	d = 136'
18"	Bracing *)		b = 8'	b = 12'	b = 20'
	Width of the concrete column parallel to the slab edge:	12"	d = 24'	d = 36'	d = 52'
		16"	d = 36'	d = 48'	d = 72'
		20"	d = 44'	d = 60'	d = 88'
		24"	d = 52'	d = 72'	d = 108'
		28"	d = 60'	d = 84'	d = 124'

*) Bracing: rough sawn, 30 degrees between slab and bracing.



a ... influence width of the bracing

b ... spacing of bracing in stringer or joist direction, as applicable

c ... influence width of the existing concrete column

d ... max. permissible center-to-center distance between the concrete columns

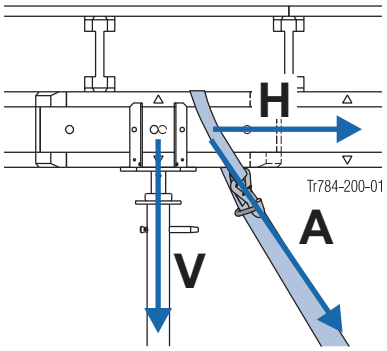
A Slab-edge (exposed)

B Bracing with Bracing clamp B

C Existing concrete column

Tie-back solutions

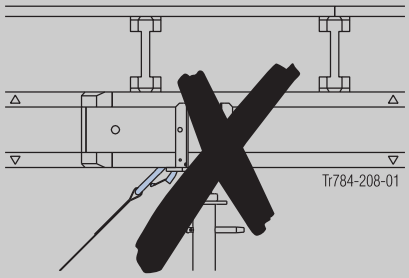
For transferring slight horizontal loads (max. 100 plf., max. 2% of dead weight, wind loads, etc.).



H Horizontal load
V Vertical load
A Tie-back force

WARNING

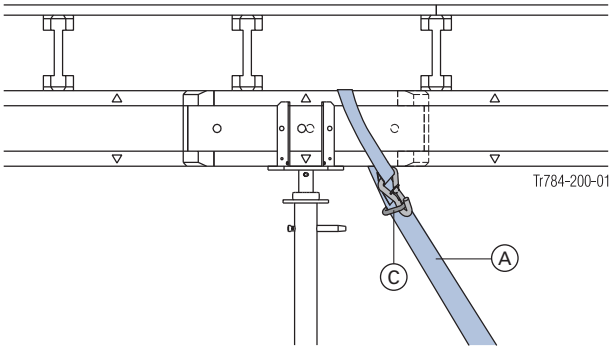
➤ Never attach the tie-back directly to a head unit or floor prop!



Follow the directions in the 'Lashing strap 5.00m' User Information booklet!

Around formwork beam and Lowering head H20

Max. tie-back load: 1120 lbs (5 kN)

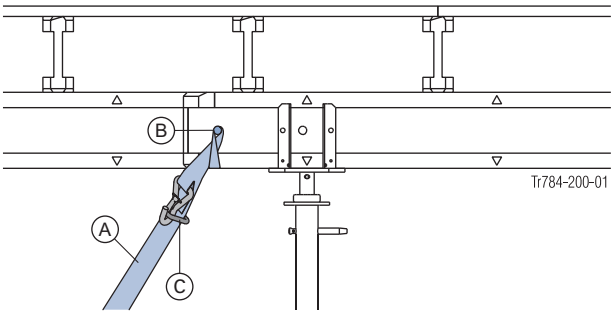


A Lashing strap 5.00m
C Triangle of the lashing strap

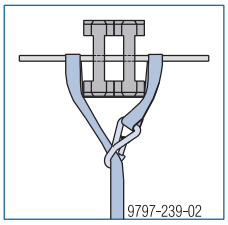
To a beam-hole

Tie-back attached to the Tie rod 20.0mm or to a length of #5 reinforcement bar inserted into a beam hole

Max. tie-back load: 1120 lbs (5 kN)



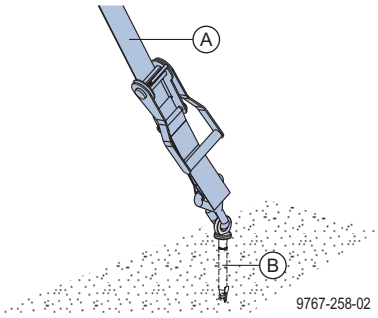
A Lashing strap 5.00m
B Tie rod 20.0mm or #5 reinforcement bar
C Triangle of the lashing strap



Anchoring the tie-back to the structure

using Doka express anchor 16x125mm

➤ Prepare an anchorage point in the ground with the Doka express anchor.
➤ Hook in the lashing strap and tension it.

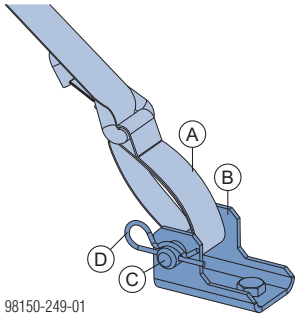


A Lashing strap 5.00m
B Doka express anchor 16x125mm

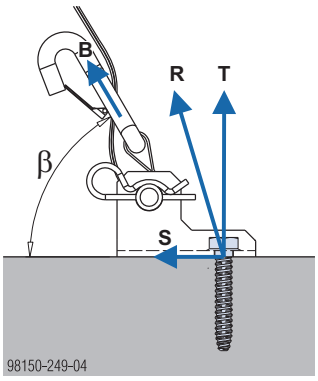
Follow the directions in the ‘Doka express anchor 16x125mm’ and ‘Lashing strap 5.00m’ User Information booklet.

Using strut shoe and alternative anchorage

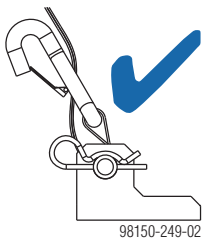
➤ Anchoring to the ground with suitable anchor, for example Red Head anchors.
Follow the installation instructions issued by the manufacturer.
➤ Form the end of the lashing strap into a loop.
➤ Slip the bolt through the strut shoe and the loop and secure it with a spring cotter.

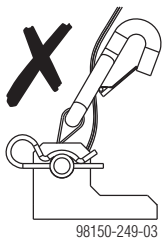


A Lashing strap 5.00m
B Strut shoe EB
C Bolt D25/93.5
D Spring cotter 5mm



β ... tie-back angle approx. 60°
B ... tie-back force
R ... resulting anchor force
S ... anchor shear force
T ... anchor tensile force



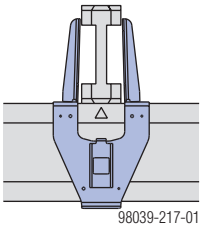
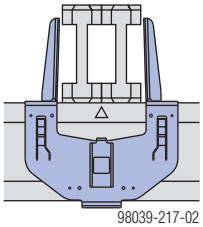


Perm. tie-back load at strut shoe: 1.73 kip (7.7 kN)
Required anchor tensile force: 3.38 kip (15.05 kN)
Required anchor shear force: 0,86 kip (3,85 kN)
resulting anchor force: 3.48 kip (15.50 kN)

General remarks

Joist stabilizers

Joist stabilizers are used to prevent formwork beams tipping over while plywood sheets are being laid on them.

Joist stabilizer 1	Joist stabilizer 2
 98039-217-01	 98039-217-02

Advantages:

- Special claws to prevent slippage on the beam-flange
- No work-platform scaffold needed, as the stabilizers can be installed/removed from ground level using an Alu beam fork H20
- Needs only small quantities, as the joist stabilizers can be re-set in tandem with the formwork erection cycle:
  - approx. 20 Joist stabilizers 1
  - approx. 10 Joist stabilizers 2

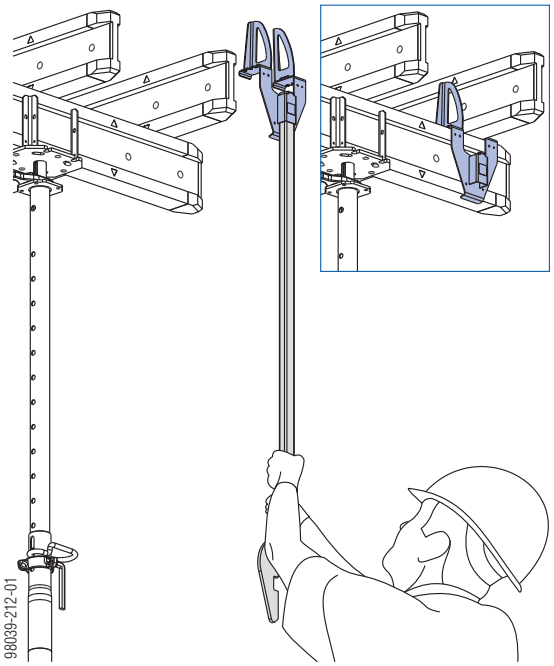
Note:

In certain special situations, (e.g. when forming inclined floor-slabs), joist stabilizers can also be used for transferring horizontal loads.

For more information, please contact your Doka- technician.

Installation:

➤ Hang the joist stabilizers into place with an Alu beam fork H20.



The joist is now held in place.

➤ Lay the plywood sheets.

➤ After the plywood sheets have been laid, unhook and remove the joist stabilizers with an Alu beam fork H20.

Combining Doka table systems

Because the superstructures of all Doka floor-slab systems share the same basic structure, they can also be used together on the site.

Dokamatic S and Dokaflex tables

The Doka tables are pre-assembled, and save on both labor and crane time. With the DoKart, the tables can easily be traveled to their next location by just one man working on his own. The system is optimized to give the very shortest forming times on large areas, and copes well with varying structural-design and geometrical requirements.

For more information see the 'Dokamatic S table', 'Dokaflex table', or 'Doka load-bearing tower Staxo 100' User Information booklets.

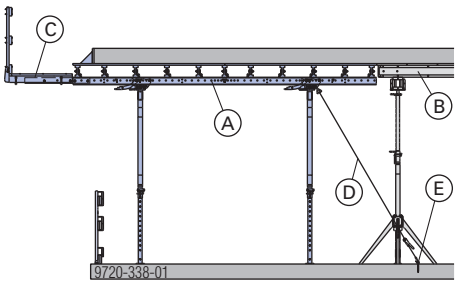
Tables around edges of slab

It can be advantageous to combine Dokaflex S with Dokamatic S tables, particularly in edge-zones.

This is an easy, safe way of forming drop-beams and slab stop-ends, and of erecting safety railings.

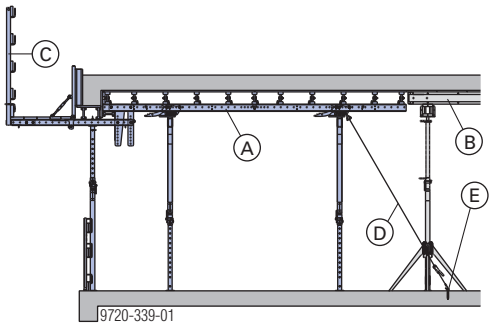
For more information see the 'Dokamatic S table', 'Dokaflex table', or 'Doka load-bearing tower Staxo 100' User Information booklets.

Without edge floor-beam



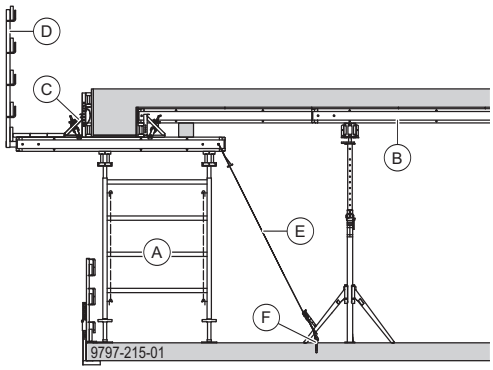
A	Dokamatic S table
B	Dokaflex S
C	Dokamatic table platform
D	Lashing strap 5.00m
E	Doka express anchor 16x125mm

With edge floor-beam



A	Dokamatic S table
B	Dokaflex S
C	Handrail post T 1.80m, Handrail clamp S or Handrail post 1.50m
D	Lashing strap 5.00m
E	Doka express anchor 16x125mm

The 10 kip shoring tower can be combined with Dokaflex S where a downturned beam needs to be formed.



A	Shoring tower
B	Dokaflex S
C	Beam forming support 20
D	Handrail post T 1.80m, Handrail clamp S or Handrail post 1.50m
E	Lashing strap 5.00m
F	Doka express anchor 16x125mm and Doka coil 16mm

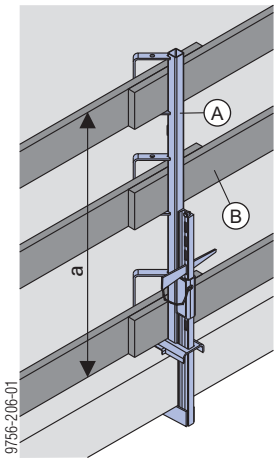
Safety railings

Safeguarding the edges of floor-slabs

Handrail clamp S

Areas of use:
- concrete floor-slabs
- platforms
- floor-slab formwork
- wall formwork

Clamped to floor-slabs or other parts of the structure with an overall height of between 1" and 1'-5".



a ... 3'-3"

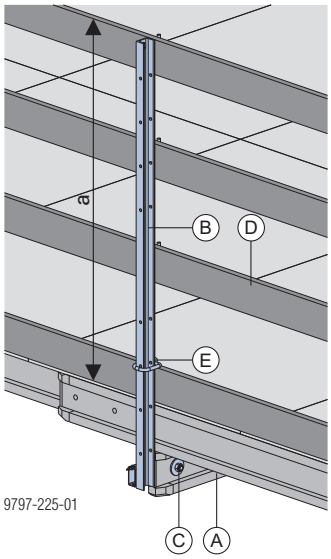
A	Handrail clamp S
B	Guardrail plank

Follow the directions in the User Information booklet "Handrail clamp S"!

Safeguarding perimeter formwork

with Handrail post T 1.80m

The Handrail post T 1.80m is ideal for constructing high barriers up to 6'-0" in height for platforms in the edge zone.



a ... 5'-11"

A	Doka beam H20 top P 4.90m
B	Handrail post T 1.80m
C	Threaded-fastener material
D	Guardrail plank
E	Toeboard holder T 1.80m

Threaded-fastener material required:
- 2 speed bolts 3/4"x4"
- 2 speed nuts 3/4"
- 2 flat washers 1/2"

Doka service offerings

Doka customer training

Formwork training pays

Forming operations account for the lion’s share of labor costs on concrete construction sites. Modern formwork equipment helps to rationalize operations. Additional efficiency is gained with a optimization of the complete construction circle.

This requires not only better equipment, but also greater skill in making optimum use of this equipment. Doka can help here, with its specialist training program - to help each and every member of the team do his bit towards boosting efficiency and lowering costs.

Doka customer training events also look at the formwork equipment and handling methods that are needed in order to achieve optimum safety - giving your people knowledge and awareness which can only enhance workplace safety on the site.

You’ll find the Doka training program well worth looking into.

The Doka branch in your region will be pleased to tell you more about Doka's various training offerings.

Shoring system, reshoring, concrete technology and stripping

What is a shoring system?

In multilevel cast-in-place building construction, freshly cast floors are supported by a system of formwork, shoring and reshores that distribute the weight of the concrete floor, reinforcement, formwork, shoring, reshores and construction live loads into the previously cast floors.

Once the newly cast floor has attained sufficient strength to support itself, the forming system, shores and reshores are cycled in such a manner as to avoid overstressing of the previously cast slabs.

The method of shoring and reshoring of slabs is critical to prevent the possibility of partial or total failure of the structure due to construction overloads. Improper reshoring or premature removal of the supports and inadequate lateral bracing causes most horizontal formwork systems failures.

It is imperative that a proper engineering analysis that considers both the construction load distribution and early age load carrying capacity of the floor-slab is performed before the shoring and reshoring operation begins.

Why put up reshoring props after stripping the formwork?

Depending on the construction sequence, reshoring props may be needed to carry **live loads** on the new floor-slab, and/or **concreting-loads** from the next floor to be poured.

Reshoring props have the job of spreading loads between the freshly cast slab and the floor beneath it. This load distribution will depend on the stiffness of the shoring/reshoring system, flexural stiffness of the slab and the rate of construction.

A compressible shore/reshoring system tends to shift more slab loads to the uppermost floors as compared to more rigid shore/reshores. An example is a comparison between wood and steel shoring and reshoring props with the wood being more compressible than steel.

The increase in slab stiffness, as a result of concrete strength gain during construction does not significantly affect the load distribution between slabs. An increase in the slab stiffness due to beams, drop panels and changes in slab thickness in a slab will result in a higher resistance to construction loads because of stiffer members within the slab.

Early age concrete strength gain does have a significant effect on the slab’s resistance to cracking and deflection.

What guidelines can be used for shoring and reshoring?

The American Concrete Institute, Committee 347 has issued two references that provide basic guidelines for general formwork operations.

The first is ACI 347R-14 'Guide to Formwork for Concrete' and the second is ACI 347.2R-17 'Guide for Shoring/Reshoring of Concrete Multistory Buildings'.

Both of these guides describe methods to evaluate the effects of the shoring and reshoring operation that can be used by the engineer/architect to determine the structural behavior of the building during construction.

The contractor, formwork designer and engineer/architect should collaborate to develop a rational shoring/reshoring design that is economical, functional and safe.

Positioning the reshoring props correctly

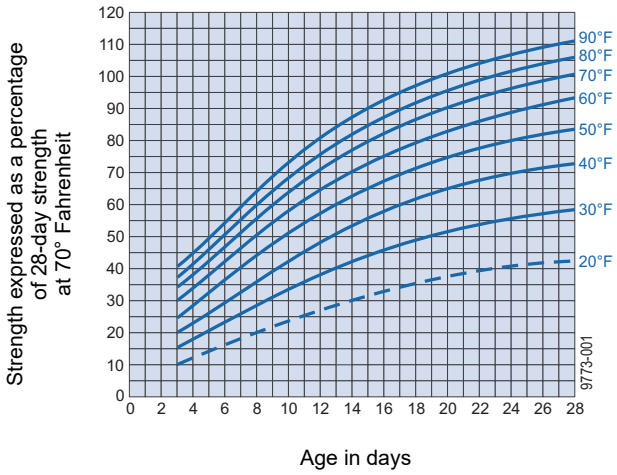
Reshoring props have the job of spreading loads between the new floor-slab and the floor beneath it. This load distribution will depend on the relationship between the rigidity of these two floor-slabs.

NOTICE

Ask the expert

As a rule, the question of using reshoring props should be referred to the responsible experts, regardless of the information given above.

Strength development in the new concrete



Effect of temperature of curing upon compressive strength of Type I, II and IV concrete. (The temperatures given are the mean temperatures encountered during the period of curing).

Deflection of the new concrete

The modulus of elasticity of the concrete develops more quickly than its compressive strength. At a compressive strength f_{ck} of about 60 %, the concrete's modulus of elasticity $E_{c(28)}$ has reached approximately 90 %.

The increase in the elastic deformation taking place in the new concrete is thus only negligible.

The creep deformation, which only finally ceases after several years, is several times more than the elastic deformation.

Early stripping – e.g. after 3 days instead of 28 – thus only leads to an increase in the total deformation of less than 5 %.

The part of this deformation accounted for by creep deformation, however, may be anything between 50 % and 100 % of the standard value, due to such variable influences as the strength of the aggregates, and the atmospheric humidity. This means that the total deflection of the floor-slab is practically independent of the time at which the formwork was struck.

Cracks in new concrete

The bonding strength between the reinforcement steel and the concrete develops more rapidly in the new concrete than does its compressive strength. This means that early stripping does not have any negative influence upon the size and distribution of cracks on the tension side of reinforced concrete constructions.

Other cracking phenomena can be countered effectively by appropriate curing methods.

Curing of new concrete

New site-placed concrete is exposed to influences which may cause cracking and slow down its strength development:

- premature drying
- over-rapid cooling in the first few days
- excessively low temperatures or frost
- mechanical damage to the surface of the concrete
- etc.

The simplest precaution is to leave the formwork on the concrete surface for longer. As well as the familiar extra curing measures, this measure should be carried out in any case.

Stripping the formwork from wide-spanned floor-slabs with support centers over 24'- 6" (7.5 m)

In the case of thin, wide-spanned concrete floor-slabs (e.g. in multistory car parks), the following points must be taken into consideration:

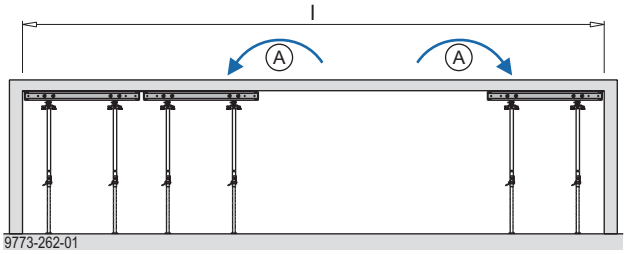
- When the formwork is removed from beneath these floor-slab spans (i.e. when the load is taken off the floor props), the floor props that are still in place are briefly subjected to additional loads. This can lead to overloading, and to the floor props being damaged.
- When planning and designing floor formworks for very thin concrete floor slabs, it is essential to allow for the **loads occurring during formwork removal**, as well as for the usual design loads.

Consult your Doka technician.

NOTICE

The basic rule is:

- Generally, when stripping out, **start at the middle of the floor slab (mid-span) and work toward the slab-edges**.
- It is imperative to adopt this procedure for wide spans!



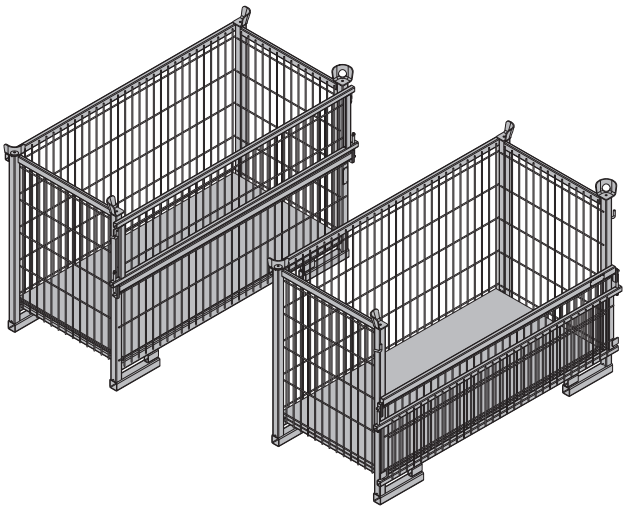
l ... Effective floor-slab spans of 24'-6" (7.5 m) and over

A Load redistribution

Transporting, stacking and storing

Utilize the benefits of Doka multi-trip packaging on your worksite.
Our Multi-trip packaging such as transport boxes, stacking pallets, accessory boxes and skeleton transport boxes keep everything in place on the site.

Doka skeleton transport box 1.70x0.80m



Storage and transport devices for small items.
To make the Doka skeleton transport box easier to load and unload, one of its sidewalls can be opened.

Permitted load-bearing capacity: 700 kg (1540 lbs)
Permitted imposed stacking load: 3150 kg (6950 lbs)

Using Doka skeleton transport boxes 1.70x0.80m as storage units

Max. n° of units on top of one another

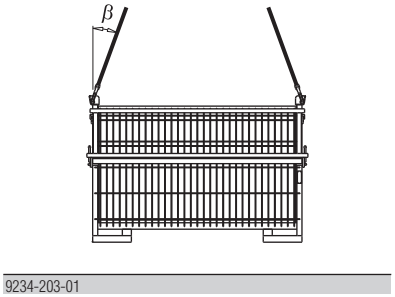
Outdoors (on the site) Floor gradient up to 3 %	**Indoors** Floor gradient up to 1 %
2	5
It is not allowed to stack empty pallets on top of one another!	

NOTICE
Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

Using Doka skeleton transport boxes 1.70x0.80m as transport devices

Lifting by crane

NOTICE
- Multi-trip packaging items may only be lifted one at a time.
- Only lift the boxes when their sidewalls are closed!
- Use a suitable lifting tackle.
  - e.g. Doka 4-part chain 3.20m
  - Do not exceed the safe working load limit of the lifting tackle
- Sling angle β max. 30°!



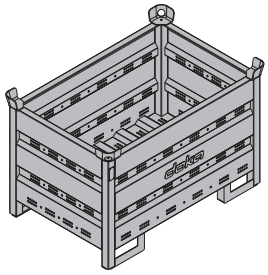
Shifting boxes with the forklift or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

Doka multi-trip transport box

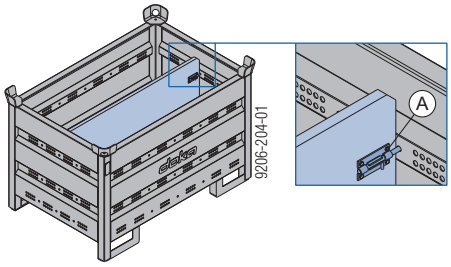
Storage and transport device for small items.

Doka multi-trip transport box 1.20x0.80m



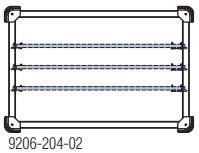
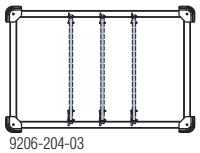
Permitted load-bearing capacity: 1500 kg (3300 lbs)
Permitted imposed stacking load: 7850 kg (17300 lbs)

Different items in the Doka multi-trip transport box can be kept separate with the **Multi-trip transport box partitions 1.20m or 0.80m**.

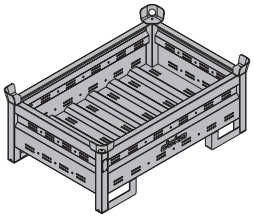


A Slide-bolt for fixing the partition

Possible ways of dividing the box

Multi-trip transport box partition	in the longitudinal direction	in the transverse direction
1.20m	max. 3 partitions	-
0.80m	-	max. 3 partitions
	 9206-204-02	 9206-204-03

Doka multi-trip transport box 1.20x0.80mx0.41m



Permitted load-bearing capacity: 750 kg (1650 lbs)
Permitted imposed stacking load: 7200 kg (15870 lbs)

Using Doka multi-trip transport boxes as storage units

Max. n° of units on top of one another

Outdoors (on the site) Floor gradient up to 3 %		Indoors Floor gradient up to 1 %	
Doka multi-trip transport box		Doka multi-trip transport box	
1.20x0.80m	1.20x0.80x0.41m	1.20x0.80m	1.20x0.80x0.41m
3	5	6	10
It is not allowed to stack empty pallets on top of one another!			

NOTICE

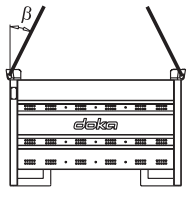
Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting tackle.
  - e.g. Doka 4-part chain 3.20m
  - Do not exceed the safe working load limit of the lifting tackle
- Sling angle β max. 30°!



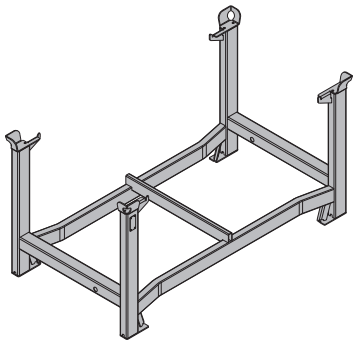
9206-202-01

Shifting boxes with the forklift or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

Doka stacking pallet 1.55x0.85m and 1.20x0.80m

Storage and transport devices for long items.



Permitted load-bearing capacity: 1100 kg (2420 lbs)
Permitted imposed stacking load: 5900 kg (13000 lbs)

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	6
Do not stack empty pallets on top of one another!	

NOTICE

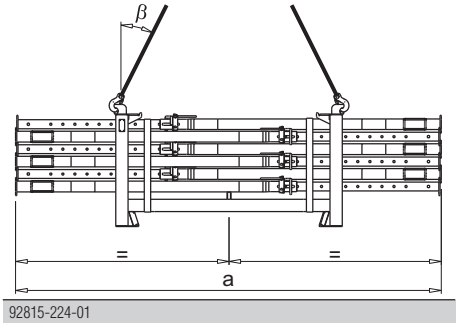
- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- **How to use with Bolt-on caster set B:**
  - Always apply the fixing brake when the container is 'parked'.
  - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

Using Doka stacking pallets as transport devices

Lifting by crane

NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Use suitable lifting chains:
  - e.g. Doka 4-part chain 3.20m
  - Do not exceed the permitted working load limit of the lifting chains.
- Load the items centrically.
- Fasten the load to the stacking pallet so that it cannot slide or tip out (e.g. with strapping tape or lashing strap).
- Sling angle β max. 30°!



	a
Doka stacking pallet 1.55x0.85m	max. 4.5 m
Doka stacking pallet 1.20x0.80m	max. 3.0 m

Shifting boxes with the forklift or pallet stacking truck

NOTICE

- Load the items centrically.
- Fasten the load to the stacking pallet so that it cannot slide or tip out (e.g. with strapping tape or lashing strap).

Transporting Bracing frames Eurex

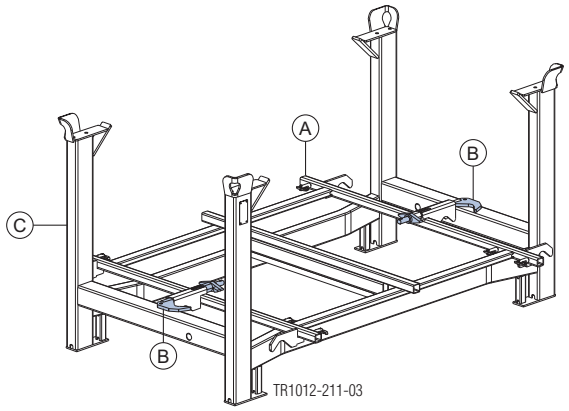
NOTICE

It is not allowed to mix different sizes of bracing frames!

Max. number of Bracing frames Eurex 1.22m per stacking pallet: 10

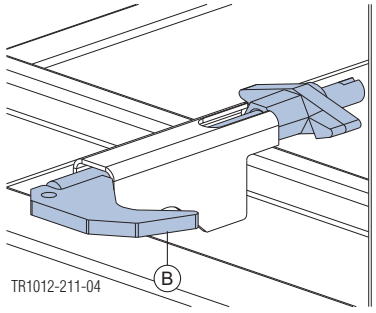
Loading the pallet

➤ Turn the prop holders (= the quick-connect mechanisms) by 90°, secure them and place the frame into the Doka stacking pallet (see Close-up 1).



A Bracing frame Eurex 1.22m
B Prop holder (= quick-connect mechanism)
C Doka stacking pallet 1.55x0.85m

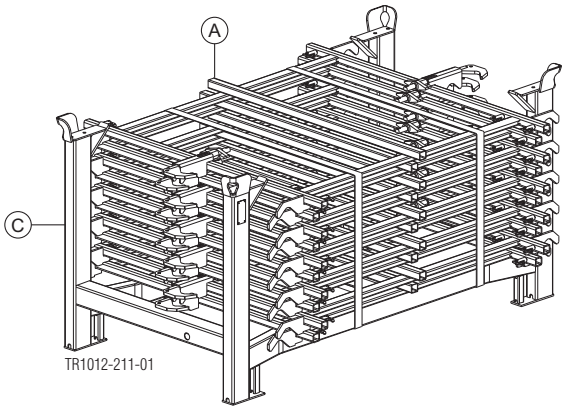
Close-up 1



B Prop holder (= quick-connect mechanism)

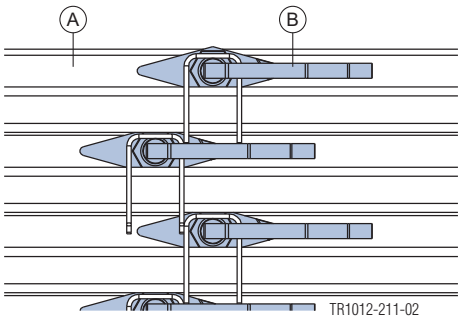
➤ Stack the other bracing frames alternate ways round (as shown in Close-up 2).

➤ Fasten the load to the stacking pallet so that it cannot slide or tip out.



A Bracing frame Eurex 1.22m
C Doka stacking pallet 1.55x0.85m

Close-up 2

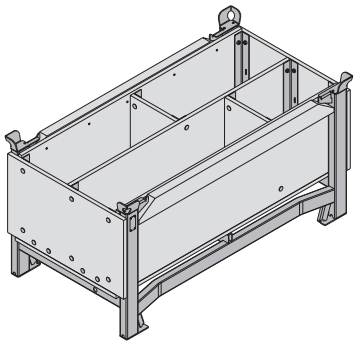


A Bracing frame Eurex 1.22m
B Prop holder (= quick-connect mechanism)

Follow the directions in the 'Bolt-on castor set B' User Information booklet!

Doka accessory box

Storage and transport devices for small items.



Permitted load-bearing capacity: 1000 kg (2200 lbs)
Permitted imposed stacking load: 5530 kg (12190 lbs)

Using Doka accessory boxes as storage units

Max. n° of units on top of one another

Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
3	6
Do not stack empty pallets on top of one another!	

NOTICE

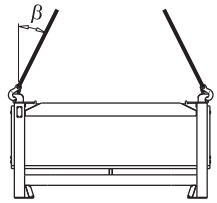
- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- **How to use with Bolt-on caster set B:**
  - Always apply the fixing brake when the container is 'parked'.
  - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

Using Doka accessory boxes as transport devices

Lifting by crane

NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting tackle.
  - e.g. Doka 4-part chain 3.20m
  - Do not exceed the safe working load limit of the lifting tackle
- When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in the ‘Bolt-on castor set B’ User Information booklet!
- Sling angle β max. 30°!



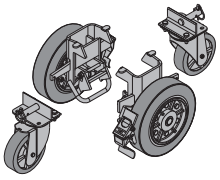
92816-206-01

Shifting boxes with the forklift or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

Bolt-on caster set B

The Bolt-on castor set B turns the multi-trip packaging unit into a fast and maneuverable transport trolley.
Suitable for drive-through access openings > 90 cm.



The Bolt-on castor set B can be installed on the following multi-trip packaging items:

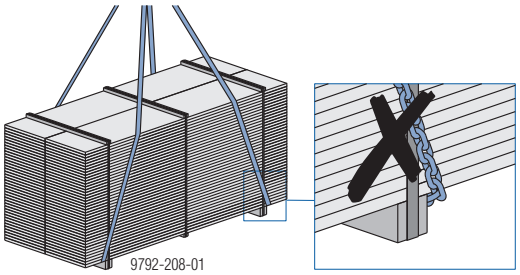
- Doka accessory box
- Doka stacking pallets
- Protective fence Z pallets

Follow the directions in the 'Bolt-on castor set B' User Information booklet!

Transporting Bracing frames Eurex

Transporting formwork sheets

- Always use slings for lifting stacked sheets - do not use chains.
- Always use edge protectors when strapping sheets together. Edge protectors can be padding made of plastic, wood or cardboard.



NOTICE

When transporting loose sheets without strapping, make sure that the sheets cannot slip!

Stacked sheets

NOTICE

- Cover stacked sheets to protect them from extreme climatic influences such as exposure to sunlight or moisture. This reduces cracking.
- On the jobsite, do not set down sheet stacks one on top of another!

➤ Always use edge protectors when strapping sheets together. Edge protectors can be padding made of plastic, wood or cardboard.

Stacked units ex-works

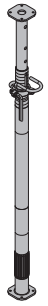
	Sheets per stack	
Dimensions	21 mm	27 mm
100/50 cm - 300/50 cm	100	80
350/50 cm - 600/50 cm	60	50
100/100 cm - 300/100 cm	50	40
350/100 cm - 600/100 cm	30	25

Strapped with metal banding together with 8 x 8 cm sleepers

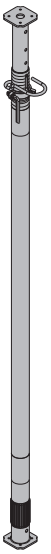
Ground condition for stacking

- Maximum ground inclination: 3%.
- The sub-base must be suitably compacted and level. Ideally, storage areas are concreted or slabbed.
- Storage on asphalt:
  Bear in mind that, depending on the parts to be stored, additional load distribution by sleepers, strips of formwork sheeting or metal plates must be ensured.
- Storage on ground of other kinds (sand, gravel, etc.):
  Implement suitable measures for storing (e.g. storage plates).

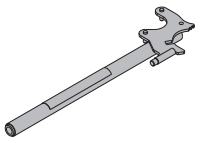
	[lbs]	Article #
Doka floor prop Eurex 30 top 250 Length: 4'-10" - 8'-2" (148 - 250 cm)	**28.2**	**586092400**
Doka floor prop Eurex 30 top 300 Length: 5'-8" - 9'-10" (173 - 300 cm)	**36.2**	**586093400**
Doka floor prop Eurex 30 top 350 Length: 6'-6" - 11'-6" (198 - 350 cm)	**45.6**	**586094400**
Doka floor prop Eurex 30 top 400 Length: 7'-4" - 13'-1" (223 - 400 cm)	**54.2**	**586095400**
Doka floor prop Eurex 30 top 450 Length: 8'-2" - 14'-9" (248 - 450 cm) Doka-Deckenstütze Eurex 30 top Galvanized	**64.2**	**586119400**



Doka floor prop Eurex 20 top 550 Doka-Deckenstütze Eurex 20 top 550 Galvanized Length: 9'-9" - 18'-1" (298 - 550 cm)	**71.2**	**586090400**



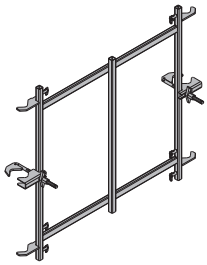
Universal dismantling tool Universal-Lösewerkzeug Galvanized Length: 2'-6" (75,5 cm)	**8.2**	**582768000**



Floor prop spring clamp Federklammer Deckenstütze Powder-coated	**0.18**	**586169000**

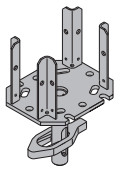
Removable folding tripod top Stützbein top Galvanized Height: 2'-7" (80 cm) Delivery condition: folded closed	**26.5**	**586155500**

Bracing frame Eurex 4'-0" Aufstellrahmen Eurex 1,22m Galvanized Height: 3'-8" (111 cm)	**35.3**	**586557000**

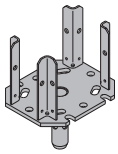


Diagonal cross 9.060	**6.8**	**582322000**
Diagonal cross 9.100	**9.0**	**582772000**
Diagonal cross 9.150	**11.5**	**582773000**
Diagonal cross 9.175	**13.4**	**582334000**
Diagonal cross 9.200	**14.6**	**582774000**
Diagonal cross 9.250	**17.0**	**582775000**
Diagonal cross 9.300	**19.8**	**582323000**
Diagonal cross 12.060	**8.8**	**582324000**
Diagonal cross 12.100	**10.1**	**582610000**
Diagonal cross 12.150	**12.6**	**582612000**
Diagonal cross 12.175	**13.9**	**582335000**
Diagonal cross 12.200	**15.2**	**582614000**
Diagonal cross 12.250	**18.3**	**582616000**
Diagonal cross 12.300	**20.5**	**582325000**
Diagonal cross 18.100	**13.4**	**582620000**
Diagonal cross 18.150	**15.2**	**582622000**
Diagonal cross 18.175	**17.2**	**582336000**
Diagonal cross 18.200	**17.2**	**582624000**
Diagonal cross 18.250	**20.1**	**582626000**
Diagonal cross 18.300	**22.7**	**582326000**
Diagonalkreuz Galvanized Delivery condition: folded closed		

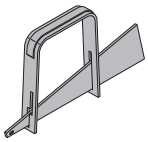
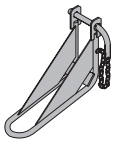
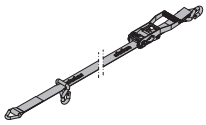
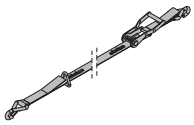
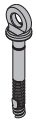
Lowering head H20 Absenkkopf H20 Galvanized Length: 10" (25 cm) Width: 8" (20 cm) Height: 1'-3" (38 cm)	**13.4**	**586174000**

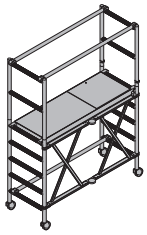
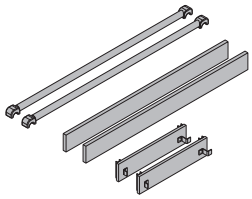
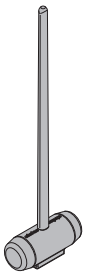
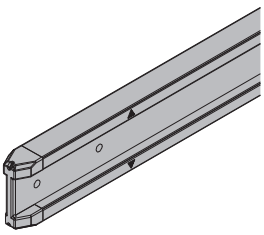


4-way head H20 Vierwegkopf H20 Galvanized Length: 10" (25 cm) Width: 8" (20 cm) Height: 1'-1" (33 cm)	**8.8**	**586170000**



Spring locked connecting pin 16mm Federbolzen 16mm Galvanized Length: 6" (15 cm)	**0.55**	**582528000**

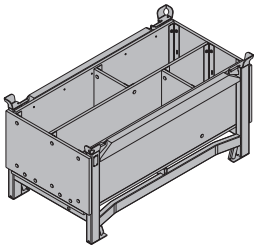
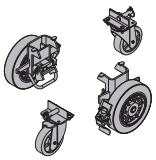
	[lbs]	Article #
Supporting head H20 DF Haltekopf H20 DF  Galvanized Length: 7 1/2" (19 cm) Width: 4 1/2" (11 cm) Height: 3 1/4" (8 cm)	**1.7**	**586179000**
Bracing clamp B Verschwertungsklammer B  Painted blue Length: 1'-2" (36 cm)	**3.1**	**586195000**
Lifting hook DF Umsetzbügel DF  Galvanized Length: 1'-5" (42 cm) Width: 8" (20 cm) Height: 1'-2" (36 cm) Follow the directions in the "Operating Instructions"!	**13.0**	**586077000**
Lashing strap 5.00m 2G Zurrgurt 5,00m 2G  Yellow	**6.4**	**586018500**
Lashing strap 5.00m Zurrgurt 5,00m  Yellow	**6.2**	**586018000**
Doka express anchor 16x125mm Doka-Expressanker 16x125mm  Galvanized Length: 7" (18 cm)	**0.68**	**588631000**
Doka coil 16mm Doka-Coil 16mm  Galvanized Diameter: 5/8" (1,6 cm)	**0.02**	**588633000**
Universal end-shutter support 30cm Universal-Abschalwinkel 30cm  Galvanized Height: 8" (21 cm)	**2.2**	**586232000**

	[lbs]	Article #
Wheel-around scaffold DF Mobilgerüst DF  Aluminum Length: 6'-1" (185 cm) Width: 2'-7" (80 cm) Height: 8'-4" (255 cm) Delivery condition: separate parts	**97.0**	**586157000**
Wheel-around scaffold DF accessory set Zubehörset Mobilgerüst DF  Aluminum Timber parts varnished yellow Length: 6'-2" (189 cm)	**29.3**	**586164000**
Plastic mallet 4kg Kunststoffhammer 4kg  Blue Length: 3'-7" (110 cm)	**9.9**	**586097000**
Alu beam fork H20 Alu-Trägergabel H20  Aluminum Powder-coated yellow Length: 5'-9" (176 cm)	**5.3**	**586182000**
Doka beam H20 top P 1.80m	**20.9**	**189701000**
Doka beam H20 top P 2.45m	**28.7**	**189702000**
Doka beam H20 top P 2.65m	**31.1**	**189703000**
Doka beam H20 top P 2.90m	**34.0**	**189704000**
Doka beam H20 top P 3.30m	**38.6**	**189705000**
Doka beam H20 top P 3.60m	**42.1**	**189706000**
Doka beam H20 top P 3.90m	**45.6**	**189707000**
Doka beam H20 top P 4.50m	**52.7**	**189708000**
Doka beam H20 top P 4.90m	**57.3**	**189709000**
Doka-Träger H20 top P  Varnished yellow		

	[lbs]	Article #
Handrail clamp S Schutzgeländerzwinge S Galvanized Height: 4' - 5'-7" (123 - 171 cm)	**25.4**	**580470000**
Handrail post T 1.80m Einschubgeländer T 1,80m Galvanized	**39.0**	**584373000**
Toeboard holder T 1.80m Fußwehrhalter T 1,80m Galvanized Height: 5 1/2" (13,5 cm)	**1.2**	**584392000**
Screw-on coupler 48mm 50 Anschraubkupplung 48mm 50 Galvanized Width-across: 22 mm	**1.8**	**682002000**
Scaffold tube 1 1/2"x6'-0" **Scaffold tube 1 1/2"x8'-0"** **Scaffold tube 1 1/2"x10'-6"** **Scaffold tube 1 1/2"x13'-0"** **Scaffold tube 1 1/2"x15'-0"** **Scaffold tube 1 1/2"x21'-0"** Gerüstrohr 1 1/2" Galvanized	**16.3** **21.8** **28.7** **35.3** **40.8** **57.1**	**585070000** **585071000** **585072000** **585073000** **585074000** **585075000**

Multi-trip packaging

	[lbs]	Article #
Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m Galvanized Height: 3'-8" (113 cm)	**192.0**	**583012000**
Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m Galvanized Height: 2'-7" (78 cm)	**154.0**	**583011000**
Multi-trip transport box partition 0.80m **Multi-trip transport box partition 1.20m** Mehrwegcontainer Unterteilung Steel parts galvanized Timber parts varnished yellow	**8.2** **12.1**	**583018000** **583017000**
Doka multi-trip transport box 1.20x0.80x0.41m Doka-Mehrwegcontainer 1,20x0,80x0,41m Galvanized	**93.7**	**583009000**
Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m Galvanized Height: 2'-6" (77 cm)	**90.4**	**586151000**
Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m Galvanized Height: 2'-6" (77 cm)	**83.8**	**583016000**

	[lbs]	Article #
Doka accessory box Doka-Kleinteilebox  Timber parts varnished yellow Steel parts galvanized Length: 5'-1" (154 cm) Width: 2'-9" (83 cm) Height: 2'-6" (77 cm) Special order only!	**235.0**	**583010000**
Bolt-on castor set B Anklemm-Radsatz B  Painted blue	**74.1**	**586168000**

	[lbs]	Article #

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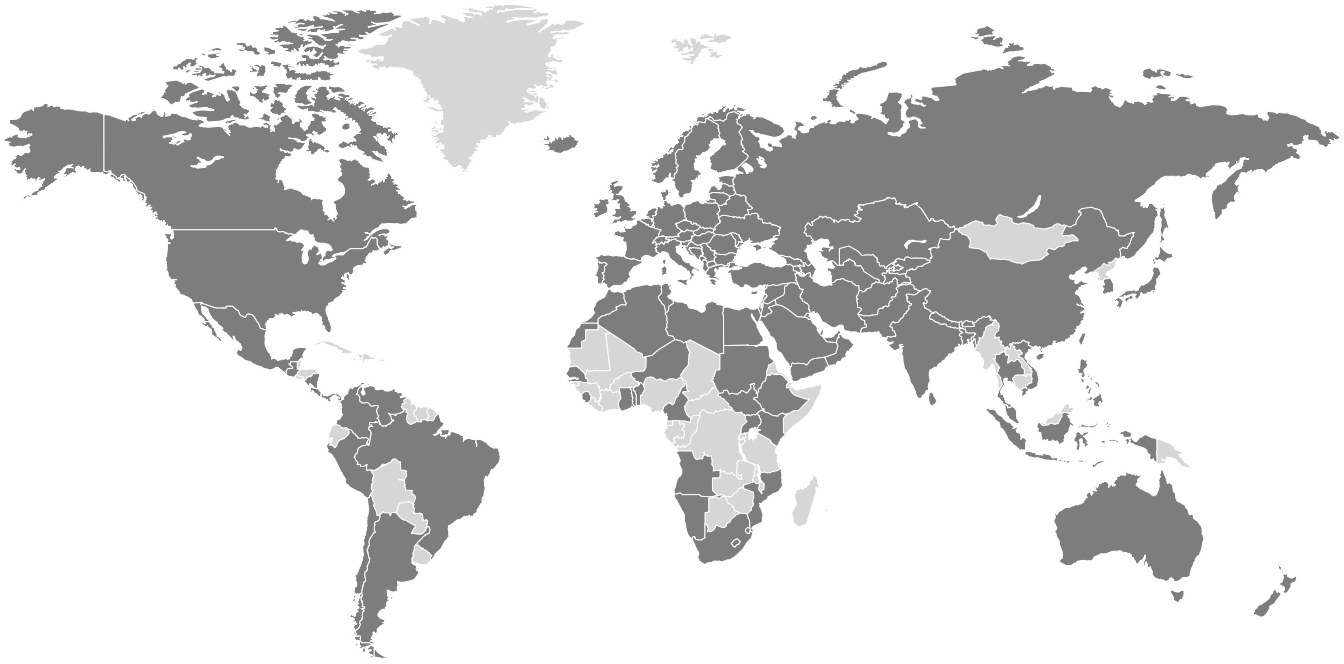

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