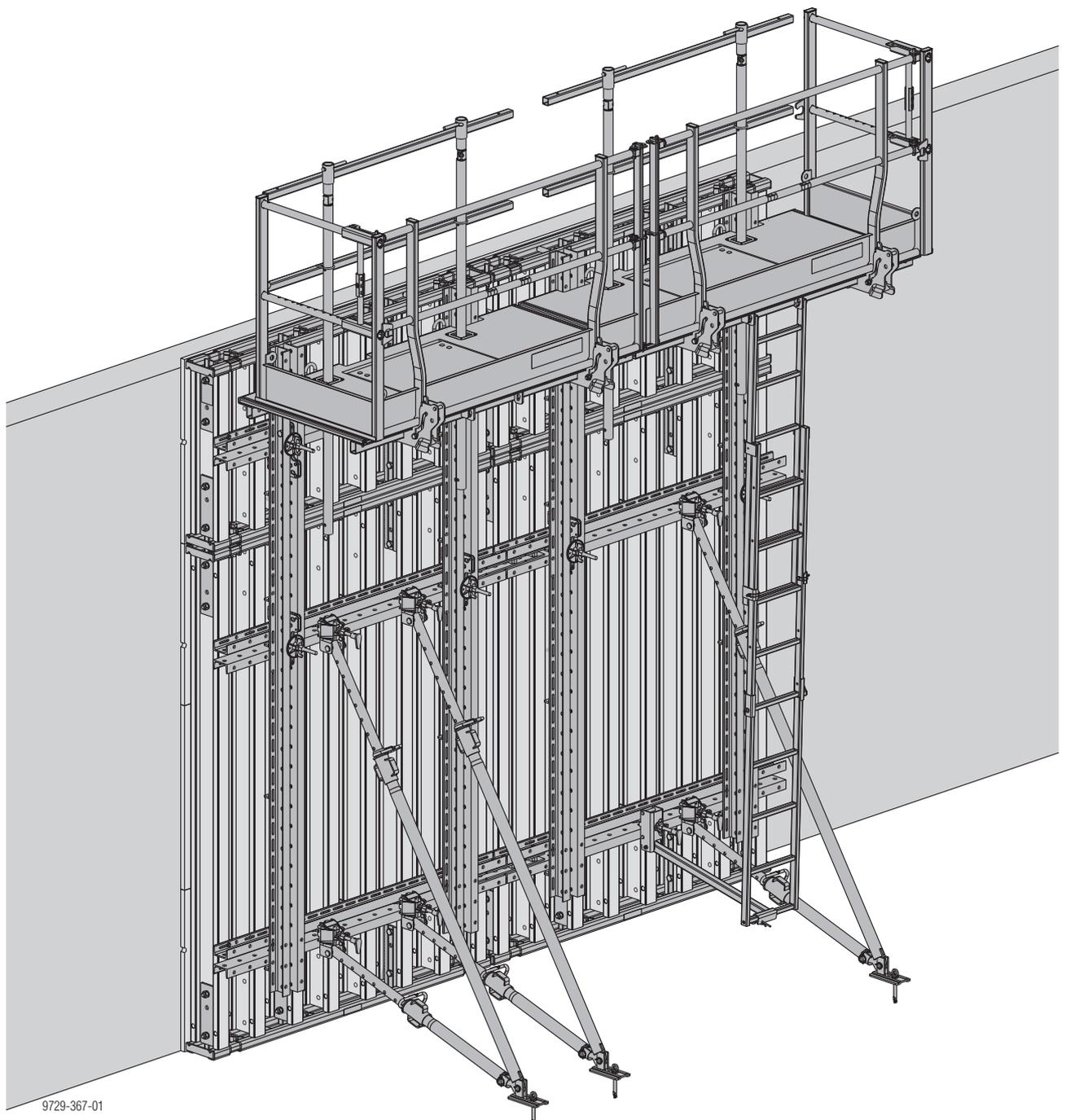


The Formwork Experts.

# Wall formwork FF20

## User Information

Instructions for assembly and use (Method statement)



9729-367-01



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# Introduction

## Elementary safety warnings

### User target groups

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- 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 utilisation 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 ensure that the information materials provided by Doka (e.g. User Information booklets, Instructions for Assembly and Use, Operating Instruction manuals, plans etc.) are up to date and available to all users, and that they have been made aware of them and have easy access to them at the usage location.
- In the relevant technical documentation and formwork utilisation 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 are obliged to ensure compliance with national laws, standards and regulations throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

### Hazard assessment

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- 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 utilise the system. It does not substitute for these, however.

### Remarks on this booklet

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- 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; industrial safety

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- All laws, Standards, industrial safety regulations and other safety rules applying to the utilisation 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 side-guard 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 must ensure that this product is erected and dismantled, reset 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 must 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).
- Strict attention to and compliance with the functional instructions, safety instructions and load specifications are required. Non-compliance can cause accidents and severe injury (risk of fatality) and considerable 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 forbidden to weld Doka products – in particular anchoring/tying components, suspension components, connector components and castings etc. – or otherwise subject them to heating.  
Welding causes serious change in the microstructure of the materials from which these components are made. This leads to a dramatic drop in the failure load, representing a very great risk to safety.  
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.  
The only articles which are allowed to be welded are those for which the Doka literature expressly points out that welding is permitted.

## Assembly

- The equipment/system must be inspected by the customer before use, to ensure that it is in an acceptable condition. Steps must be taken to exclude components that are damaged, deformed, or weakened due to wear, corrosion or rot (e.g. fungal decay).
- Using our safety and formwork systems together with those of other manufacturers can create risks that may lead to injury and damage to property. This requires separate verification by the user.
- The equipment/system must be assembled and erected in accordance with the applicable laws, standards and rules by trained customer personnel whilst maintaining any applicable safety inspections that may be required.
- It is not permitted to modify Doka products; such modifications constitute a safety risk.

## Closing the formwork

- Doka products and systems must be set up so that all loads acting upon them are safely transferred!

## Pouring

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

## Stripping the formwork

- Do not strip out the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be stripped out!
- When stripping out 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 stripping corners.
- When stripping out 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 document, 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 authorised facilities.

## Miscellaneous

The weights as stated are averages for new material; actual weights can differ, depending on material tolerances. Dirt accretions, moisture saturation, etc. can also affect weight.

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

## Eurocodes at Doka

**The permissible values stated in Doka documents (e.g.  $F_{perm} = 70$  kN) are not design values (e.g.  $F_{Rd} = 105$  kN)!**

- It is essential to avoid confusing permissible values with design values!
- Doka documents will continue to state the permissible values.

Allowance has been made for the following partial factors:

- $\gamma_F = 1.5$
- $\gamma_{M, timber} = 1.3$
- $\gamma_{M, steel} = 1.1$
- $k_{mod} = 0.9$

Consequently, all the design values for an EC design calculation can be determined from the permissible values.

## Symbols used

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.



### NOTICE

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.



### Sight-check

Indicates that you need to do a sight-check to make sure that necessary actions have been carried out.



### Tip

Points out useful practical tips.



### Reference

Cross-references other documents.

# Services

## Support in every stage of the project

- Project success assured by products and services from a single source.
- Competent support from planning through to assembly directly on site.

### Project assistance from start to finish

Every single project is unique and calls for individualised solutions. When it comes to the forming operations, the Doka team can help you with its consulting, planning and ancillary services in the field, enabling you to carry out your project effectively, safely and reliably. Doka assists you with individual consulting services and customised training courses.

### Efficient planning for a safe project sequence

Efficient formwork solutions can only be developed economically if there is an understanding of project requirements and construction processes. This understanding is the basis of Doka engineering services.

### Optimise construction workflows with Doka

Doka offers special tools that help you in designing transparent processes. This is the way to speed up pouring processes, optimise inventories and create more efficient formwork planning processes.

### Custom formwork and on-site assembly

To complement its system formwork range, Doka offers customised formwork units. And specially trained personnel assemble load-bearing towers and formwork on site.

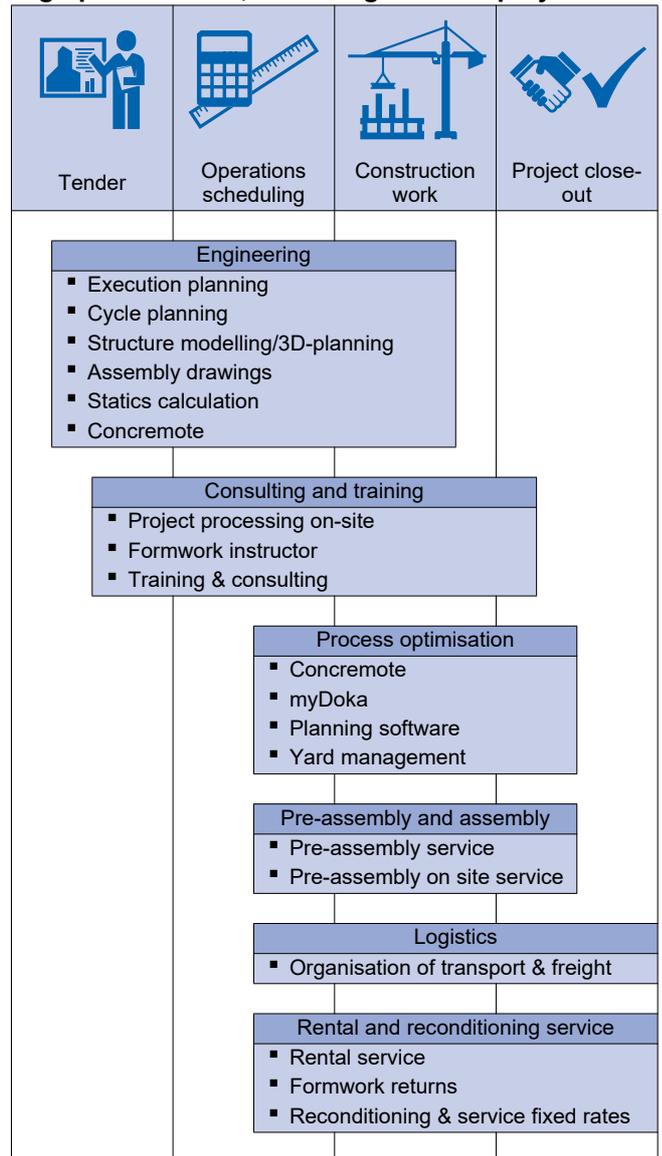
### Just-in-time availability

Formwork availability is a crucial factor in realising your project on time and on budget. The worldwide logistics network puts the necessary formwork quantities on site at the agreed time.

### Rental and reconditioning service

The formwork material needed for any particular project can be rented from Doka's high-performing rental park. Doka Reconditioning cleans and overhauls both client-owned equipment and Doka rental equipment.

## High performance, in all stages of the project



### upbeat construction digital services for higher productivity

From planning through to completion - with upbeat construction we'll be moving construction forward and upping the beat for more productive building with all our digital services. Our digital portfolio covers the entire construction process and is being extended all the time. To find out more about our specially developed solutions go to [doka.com/upbeatconstruction](https://doka.com/upbeatconstruction).

# Wall formwork

## Product description

### Doka wall formwork FF20 - the ready-to-use wall formwork also for fair-faced concrete

The Doka wall formwork FF20 comes with ready-to-use elements for the most common pour heights. In this way, it combines the advantages of a timber-beam formwork with the grid-related advantages of a framed formwork system.

#### Permitted fresh-concrete pressure:

See the section headed 'Formwork element FF20 in detail'.

Vertical stacking is easy and the formwork elements FF20 have a height grid well matched to the requirements of jobsite usage. Installing box-outs and fixtures is straightforward.

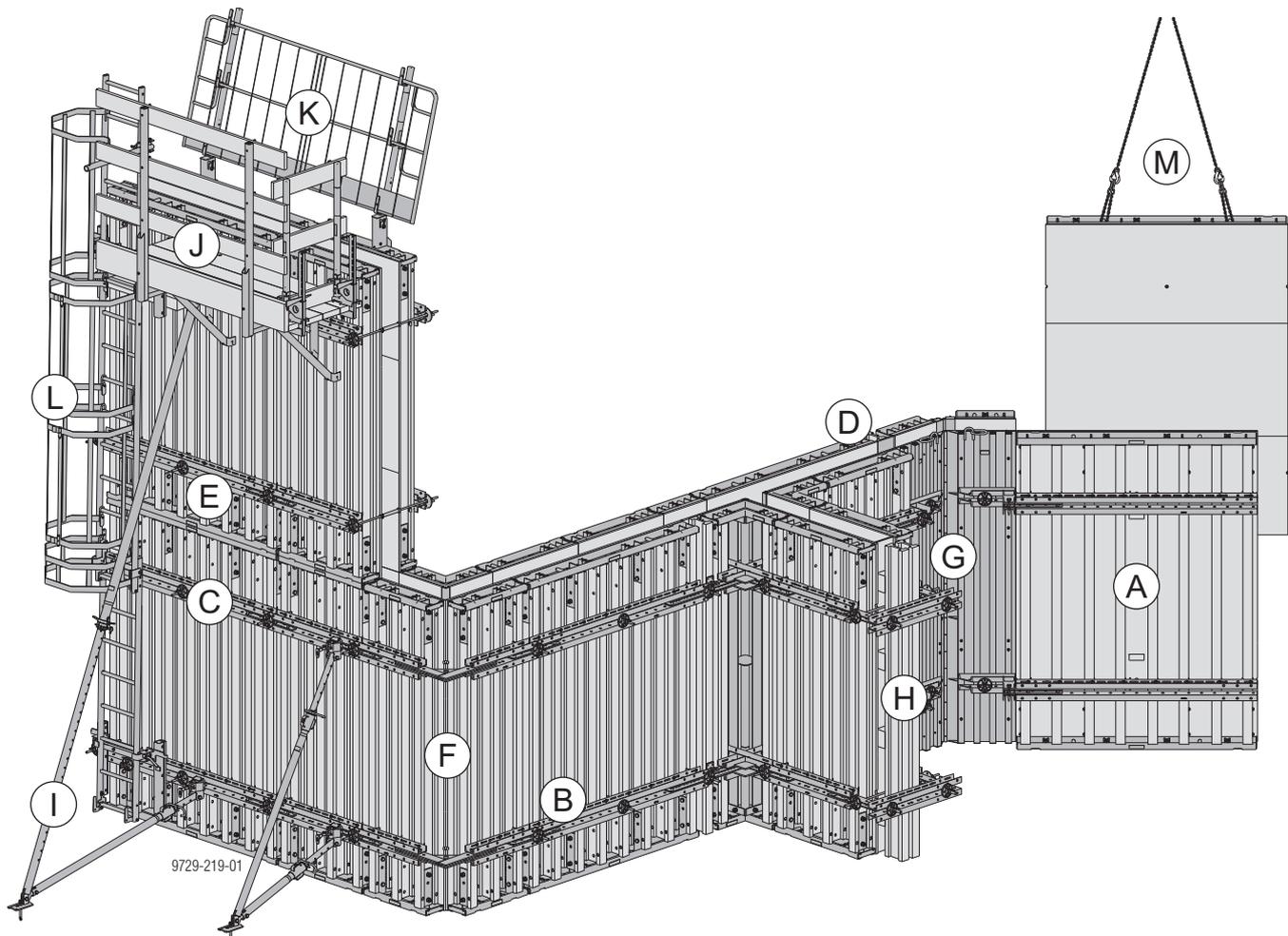
Doka wall formwork FF20 is faced with top-class formwork sheeting.

The big benefit for you: **first-class concrete surfaces**

A range of practical accessories makes work on the site a lot easier and does away with the need for costly job-site improvisations.

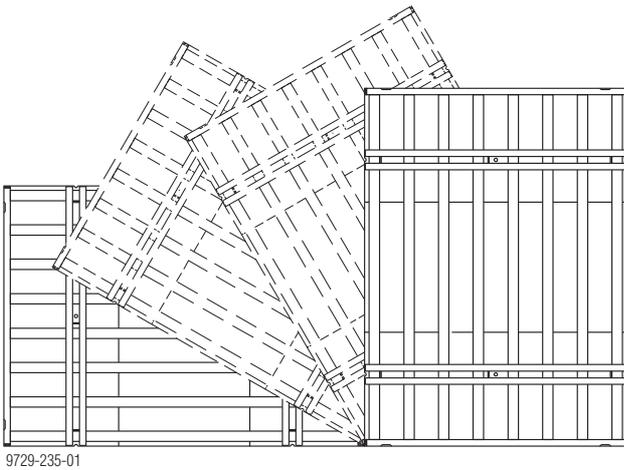
#### Section:

<b>A</b>	Formwork element FF20
<b>B</b>	Inter-panel connections
<b>C</b>	Tie rod system
<b>D</b>	Length adjustment using closures
<b>E</b>	Vertical stacking of panels
<b>F</b>	90 degree corners
<b>G</b>	Acute and obtuse-angled corners
<b>H</b>	Stop-end formwork
<b>I</b>	Plumbing accessories
<b>J</b>	Pouring platforms with single brackets
<b>K</b>	Opposing guardrail
<b>L</b>	Ladder system
<b>M</b>	Lifting by crane



## Formwork elements FF20 installed on their sides

Formwork elements FF20 can be installed upright or on their sides.



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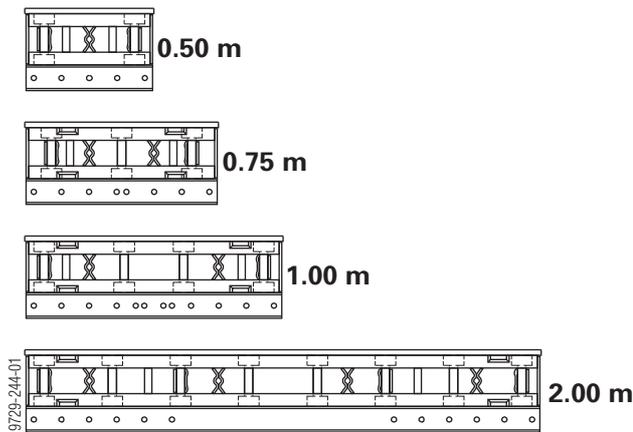
# System grid

The heights and widths of the formwork elements FF20 together result in a logical, advantageous increment-grid that makes this formwork highly flexible and economical.

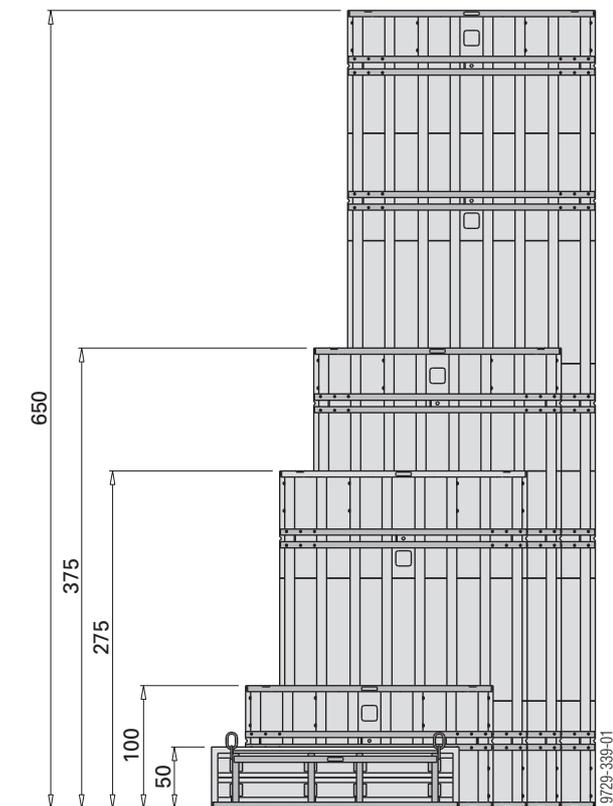
- Easy planning and forming
- 25 cm grid with only 4 different element widths
- Clear joint pattern

## Formwork elements FF20 sheet thickness 21 mm

### Panel widths



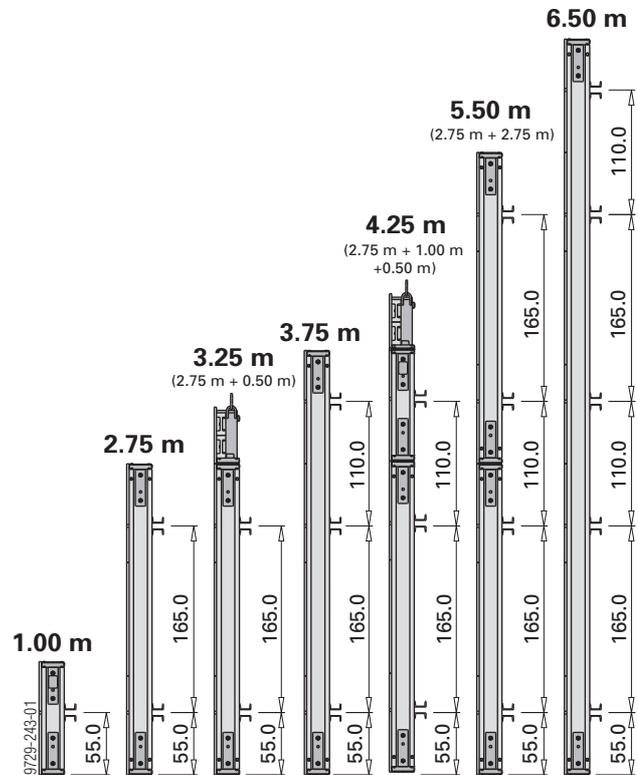
### Panel heights



Dimensions in cm

## Practical height grid

In this element size-grid, there are innumerable possible combinations of both width and height. You can use the elements **upright** or **on their sides**; the **25 cm grid** enables you to adapt the formwork ideally to the structure's dimensions every time.





## Instructions for assembly and use for room-high formwork

The sequence shown here is based on a straight wall. However, you should always start to form from the corner outwards.

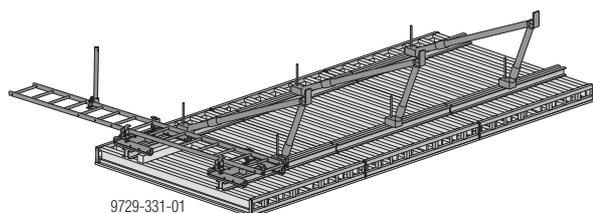
Ladders must be located so as to create viable 'traffic routes' in the horizontal. (On a straight wall, for example, one ladder on the first element and another on the last).

### Transporting / handling the panels

- ▶ When loading panels on to a truck and unloading, or lifting panels singly or a stack at a time, use the Dokamatic lifting strap 13.00m (see the section headed 'Transporting, stacking and storing').

### Pre-assembly

- ▶ Pre-assemble elements face-down on an assembly bench (see 'Inter-panel connections').
- ▶ With the gang-form still flat, mount panel struts to it (see 'Plumbing accessories').
- ▶ Mount the Ladder system XS (see 'Ladder system').

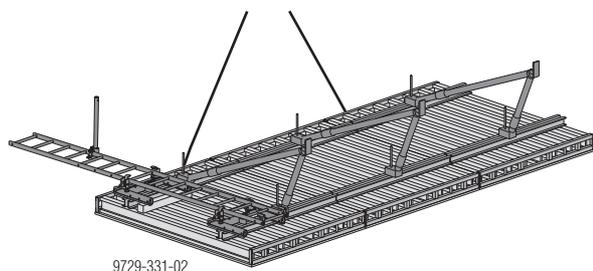


### Closing the formwork

- ▶ Loop the Lifting chain 100cm 15kN around the round pin of the stacking flange and attach it to the crane (see the section headed 'Lifting by crane').

#### Permissible total weight of each unit for repositioning:

Attachment to a panel 2.00 m wide: 2000 kg  
Attachment to a narrower panel: 1500 kg



- ▶ Raise the gang-form by crane.
- ▶ Spray the formwork sheet with release agent (see the section headed 'Cleaning and care of your equipment').
- ▶ Fly the gang-form to its new location.



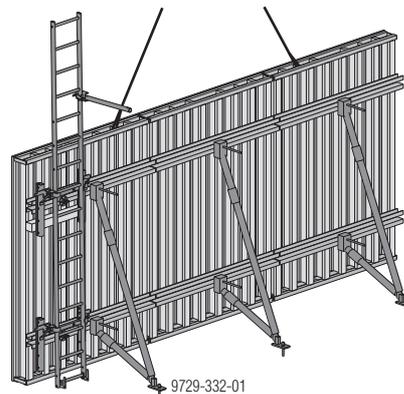
#### CAUTION

Never use a sledge hammer to plumb and align the elements!

This would damage the elements.

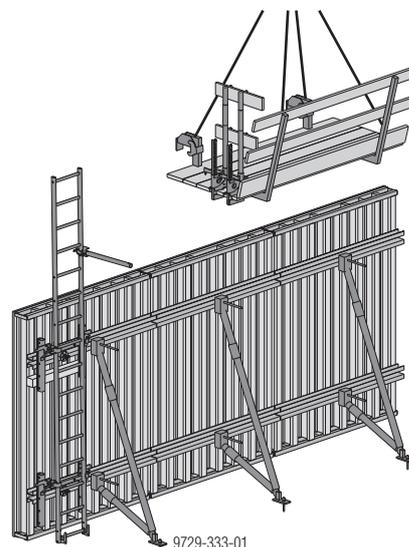
- ▶ Use only proper plumbing tools (e.g. a special pry-bar) that cannot cause any damage.

- ▶ Fix the panel struts firmly to the ground (see the section headed 'Plumbing accessories').



The gang-form is now stable and can be plumbed and aligned exactly, with no need for the crane.

- ▶ Detach the gang-form from the crane. The crew can reach the slinging points by standing on a step stool.
- ▶ Slot the pouring platform into place (see the section headed 'Pouring platforms').



#### WARNING

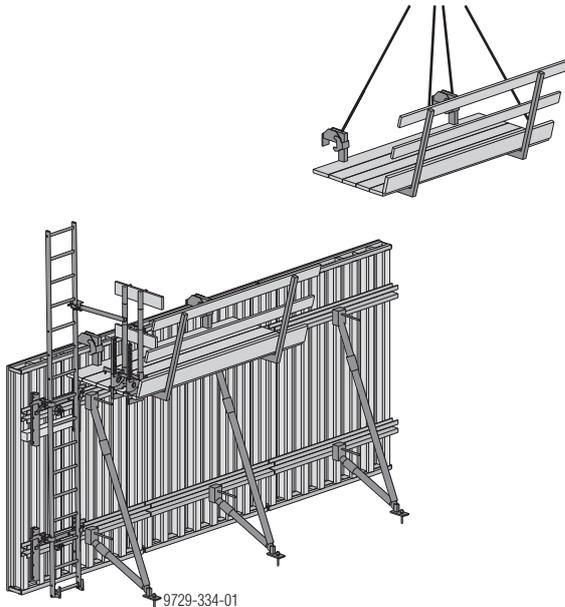
There is not yet an opposing guardrail on the formwork!

Danger to life from fatal falls!

- ▶ Either use a personal fall-arrest system (e.g. safety harness) or mount an opposing guardrail to the gang-form while this is still being pre-assembled in a flat position.

- ▶ Detach the pouring platform from the crane.

- ▶ Continue lining up further gang-forms in this way, and link them together (see the section headed 'Inter-panel connections').

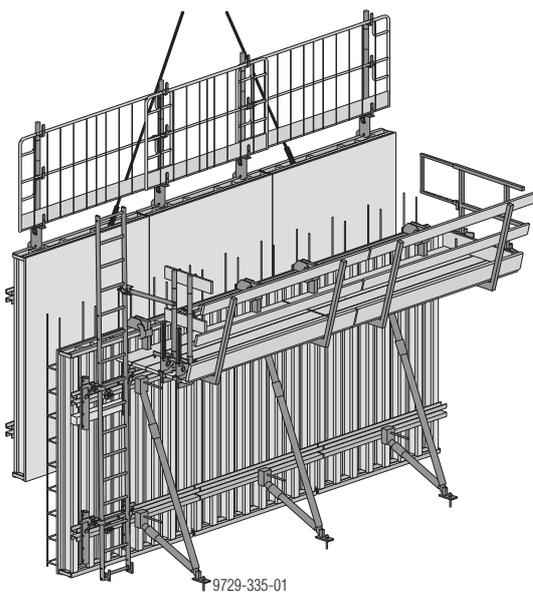


- ▶ Fit end-of-platform sideguards (see the section headed 'Pouring platforms').

### Erecting the opposing formwork:

**Once the reinforcement has been placed, the formwork can be closed.**

- ▶ Mount the opposing guard-rail to the (laid-flat) gang-form of the opposing formwork (see the section headed 'Opposing guard-rail').
- ▶ Spray the formwork sheet with release agent (see the section headed 'Cleaning and care of your equipment').
- ▶ Lift the opposing formwork by crane to its next location.



- ▶ Fit the form ties (see the section headed 'Tie rod system').



**Before disconnecting from the crane:**

- ▶ If there are no panel struts on the opposing formwork, do not disconnect the element from the crane until a large enough number of form ties have been installed to keep it safely in the upright.
- ▶ Detach the gang-form from the crane (wherever possible, operate the lifting chain from the opposite pouring platform).
- ▶ Continue lining up further gang-forms in this way, and link them together (see the section headed 'Inter-panel connections').

## Pouring

### Permitted fresh-concrete pressure:

See the section headed 'Formwork element FF20 in detail'.

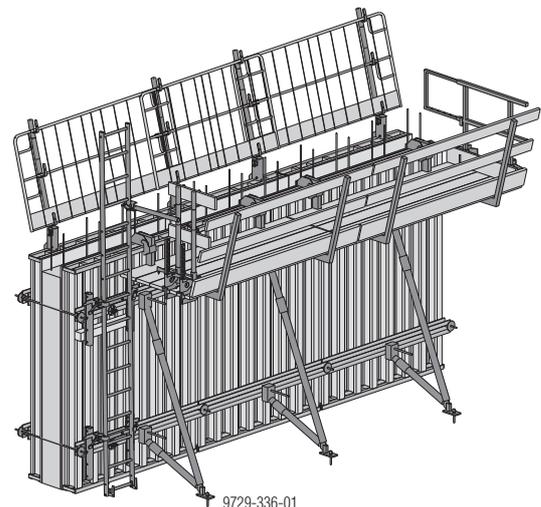
Observe the following **guidelines**:

- The section headed 'Pressure of fresh concrete on vertical formwork – DIN 18218' in the Calculation Guide 'Doka formwork engineering'
- DIN 4235 Part 2 - 'Compacting of concrete by vibrating'



### NOTICE

- ▶ Do not exceed the maximum permissible rate of placing.
- ▶ Pour the concrete.
- ▶ Make only moderate use of vibrators, carefully coordinating the times and locations of vibrator use.

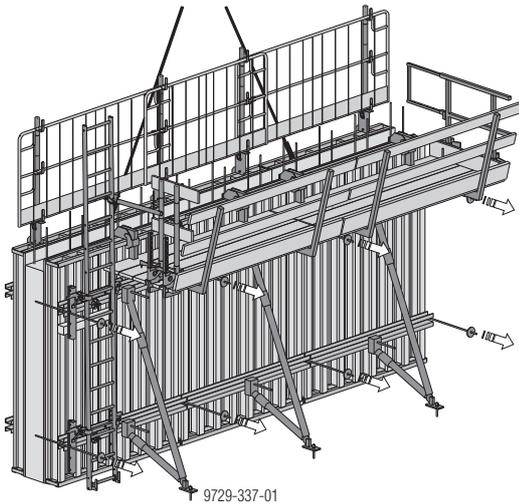


## Stripping the formwork

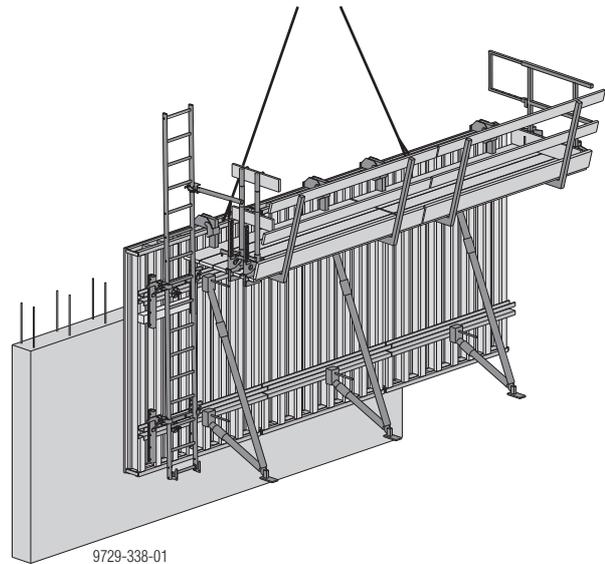


### NOTICE

- ▶ Comply with the stipulated stripping times.
- ▶ Remove any loose items from the formwork and platforms, or secure them firmly.
- ▶ Attach the gang-form of the opposing formwork to the crane (wherever possible, operate the lifting chain from the opposite pouring platform).
- ▶ Take out the form ties and undo the connectors to the adjacent elements.



- ▶ Where the gang-form has panel struts and a pouring platform attached to it, first attach this gang-form to the crane, and only then detach the floor anchorages of the panel struts.



In order to speed up operations when lifting and repositioning by crane, most of the form ties can be taken out in advance.

### Important!

There must be at least as many form ties left in place as are needed to keep the elements safely in the upright.



### WARNING

The formwork tends to adhere to the concrete. When stripping the formwork, do not try to break concrete cohesion using the crane! Risk of crane overload.

- ▶ Use suitable tools such as timber wedges or a special pry-bar to detach the formwork from the concrete.
- ▶ Lift the gang-form away and to its next location. If the gang-form is 'parked' prior to its next use, it must have sufficient stability (see the section headed 'Plumbing accessories'). Gang-forms with only one panel strut must not be 'parked' upright, but placed face-down.
- ▶ Clean residual concrete off the formwork sheet (see the section headed 'Cleaning and care of your equipment').

## Instructions for assembly and use for high formwork

The sequence shown here is based on a straight wall. However, you should always start to form from the corner outwards.

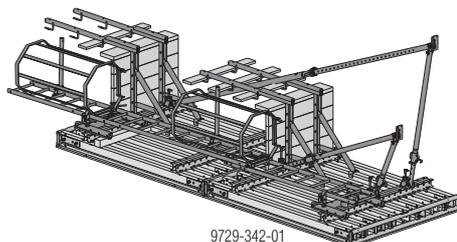
Ladders must be located so as to create viable 'traffic routes' in the horizontal. (On a straight wall, for example, one ladder on the first element and another on the last).

### Transporting / handling the panels

- ▶ When loading panels on to a truck and unloading, or lifting panels singly or a stack at a time, use the Dokamatic lifting strap 13.00m (see the section headed 'Transporting, stacking and storing').

### Pre-assembly

- ▶ Pre-assemble gang-forms 'flat on their backs' on an assembly bench (see the section headed 'Inter-panel connections').
- ▶ Only mount the platforms, ladder system and panel struts to the gang-form when this is laid flat on its back (see the sections headed 'Pouring platforms with single brackets', 'Ladder system' and 'Plumbing accessories').



### Closing the formwork

- ▶ Loop the Lifting chain 100cm 15kN around the round pin of the stacking flange and attach it to the crane (see the section headed 'Lifting by crane').

#### Permissible total weight of each unit for repositioning:

Attachment to a panel 2.00 m wide: 2000 kg  
Attachment to a narrower panel: 1500 kg

- ▶ Raise the gang-form by crane.
- ▶ Spray the formwork sheet with release agent (see the section headed 'Cleaning and care of your equipment').
- ▶ Fly the gang-form to its new location.



#### CAUTION

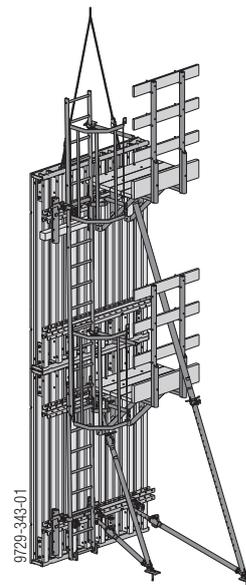
Never use a sledge hammer to plumb and align the elements!

This would damage the elements.

- ▶ Use only proper plumbing tools (e.g. a special pry-bar) that cannot cause any damage.

- ▶ Fix the panel struts firmly to the ground (see the section headed 'Plumbing accessories').

- ▶ Mount the top guardrail boards.



The gang-form is now stable and can be plumbed and aligned exactly, with no need for the crane.



#### WARNING

There is not yet an opposing guardrail on the formwork!

Danger to life from fatal falls!

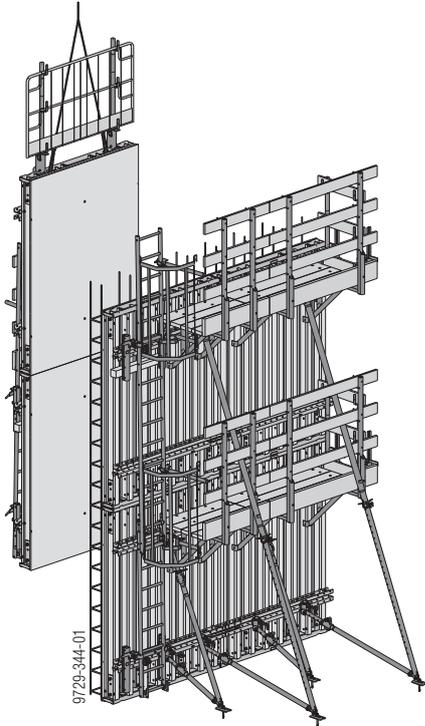
- ▶ Either use a personal fall-arrest system (e.g. safety harness) or mount an opposing guardrail to the gang-form while this is still being pre-assembled in a flat position.

- ▶ Detach the gang-form from the crane.
- ▶ Continue lining up further gang-forms in this way, and link them together (see the section headed 'Inter-panel connections').

## Erecting the opposing formwork:

Once the reinforcement has been placed, the formwork can be closed.

- ▶ Spray the formwork sheet with release agent (see the section headed 'Cleaning and care of your equipment').
- ▶ Lift the opposing formwork by crane to its next location.



- ▶ Working from the ground, insert the bottom rows of form ties (see the section headed 'Tie rod system').



### WARNING

There is not yet an opposing guardrail on the formwork!

Danger to life from fatal falls!

- ▶ Use a personal fall-arrest system (e.g. safety harness).



Before disconnecting from the crane:

- ▶ If there are no panel struts on the opposing formwork, do not disconnect the element from the crane until a large enough number of form ties have been installed to keep it safely in the upright.

- ▶ Detach the gang-form from the crane.
- ▶ Insert the remaining form ties. These form-tie locations can be reached from the platforms.
- ▶ Continue lining up further gang-forms in this way, and link them together (see the section headed 'Inter-panel connections').

## Pouring

### Permitted fresh-concrete pressure:

See the section headed 'Formwork element FF20 in detail'.

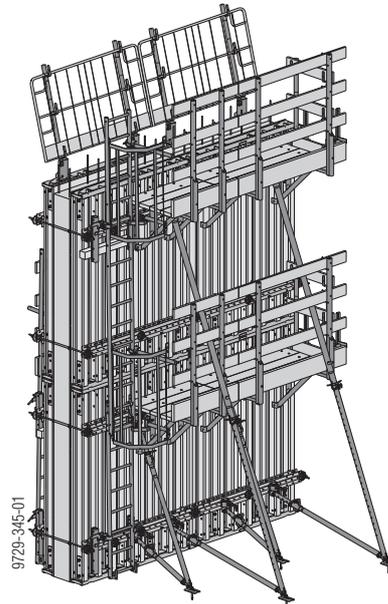
Observe the following **guidelines**:

- The section headed 'Pressure of fresh concrete on vertical formwork – DIN 18218' in the Calculation Guide 'Doka formwork engineering'
- DIN 4235 Part 2 - 'Compacting of concrete by vibrating'



### NOTICE

- ▶ Do not exceed the maximum permissible rate of placing.
- ▶ Pour the concrete.
- ▶ Make only moderate use of vibrators, carefully coordinating the times and locations of vibrator use.



## Stripping the formwork



### NOTICE

- ▶ Comply with the stipulated stripping times.
- ▶ Remove any loose items from the formwork and platforms, or secure them firmly.

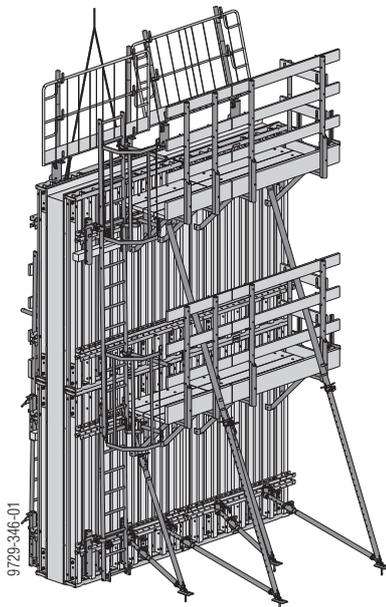
### Begin work on stripping the formwork on the opposing formwork:

- ▶ Undo the connectors to the adjacent elements.



### WARNING

- ▶ There must be at least as many form ties left in place as are needed to keep the element safely in the upright.
- ▶ Take out the form ties from the top rows of ties. These form-tie locations can be reached from the platforms.
- ▶ Attach the gang-form (incl. platforms) to the crane.
- ▶ Working from the ground, take out the bottom rows of form ties.

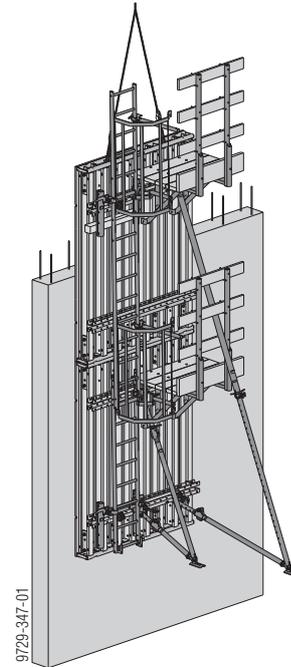


### WARNING

There is not yet an opposing guardrail on the formwork!

Danger to life from fatal falls!

- ▶ Use a personal fall-arrest system (e.g. safety harness).
- ▶ Where the gang-form has panel struts and a pouring platform attached to it, first attach this gang-form to the crane, and only then detach the floor anchorages of the panel struts.



### WARNING

The formwork tends to adhere to the concrete. When stripping the formwork, do not try to break concrete cohesion using the crane!

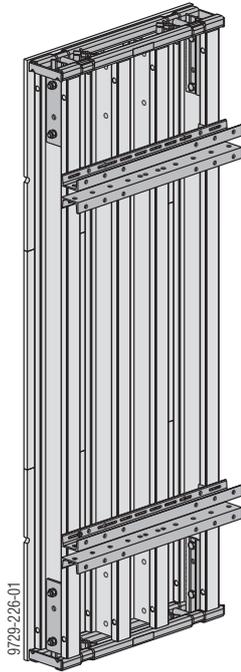
Risk of crane overload.

- ▶ Use suitable tools such as timber wedges or a special pry-bar to detach the formwork from the concrete.
- ▶ Lift the gang-form away and to its next location, or place it flat on its back for intermediate storage.
- ▶ Clean residual concrete off the formwork sheet (see the section headed 'Cleaning and care of your equipment').

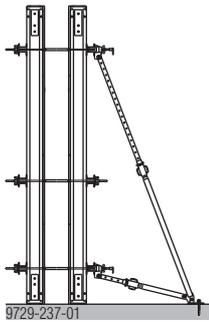
## Formwork element FF20 in detail

### High load-bearing capacity

**Permitted fresh-concrete pressure  $\sigma_{hk}$ : 50 kN/m<sup>2</sup>**



**Permitted fresh concrete pressure  $\sigma_{hk}$  Formwork elements FF20 3.75m upside-down, pouring height up to 3.75 m: 80 kN/m<sup>2</sup>**



### Form-facing

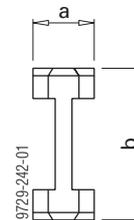
- 21 mm or 27 mm three-ply, specially treated FF20 sheet
- only two sheet joints, producing an exact and attractive concrete surface
- the sheets are quick and easy to change
- In relation to the following special versions of the formwork elements FF20, contact the nearest Doka branch.
  - Facing with other types of sheeting
  - Installation of profiled timber formers
  - Open formwork with large-area formwork sheets
  - Tongue and groove formwork

### Steel walings (multipurpose walings)

- hold the Doka H 20 beams in place and give the element rigidity
- sustain the forces from the form-ties
- make the elements easy to join, using plates and connecting pins

### Doka beam H20

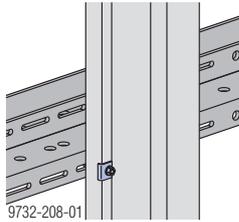
solid-web design; light, strong and dimensionally accurate



a ... 8 cm  
b ... 20 cm

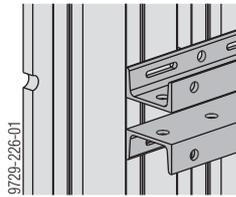
## Fastening the beams

Doka formwork beams H20 and Multi-purpose walings WS10 Top50 are bolted to each other. This makes the formwork elements FF20 stronger and more durable.



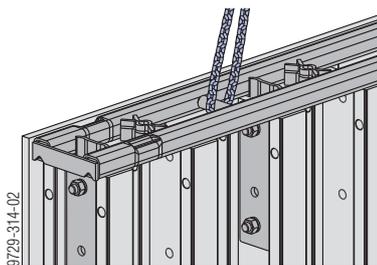
## Tie-holes

- The tie-holes are pre-drilled, so the form tie is always in exactly the right place

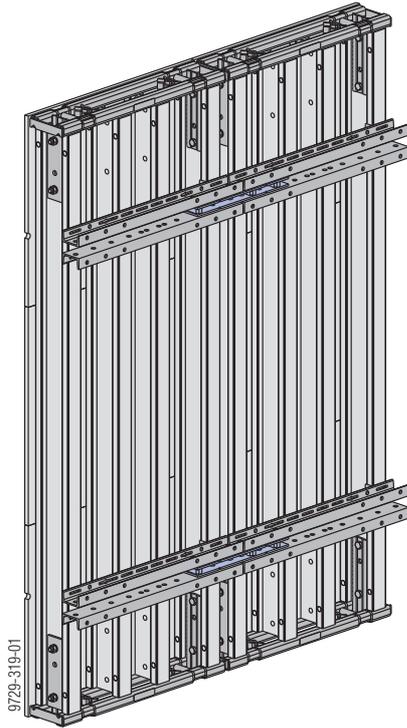


## Stacking flange

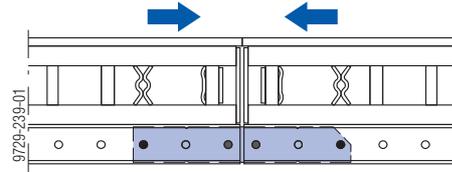
- Enables precision-jointing of the elements for vertical stacking
- Protects the beam ends
- Crane lifting point integrated, so no protruding parts to obstruct pouring
- Powder-coated, so easy to clean
- Positioning points for plumbing tools, so plumbing the formwork is faster and easier



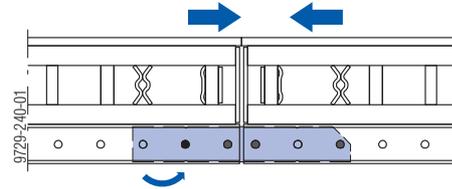
# Inter-panel connections



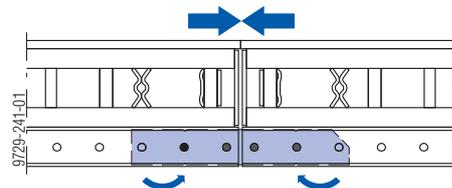
To fit normally



To pull tight half the way



To pull tight all the way



**Note:**

Only pull tight where there actually is a gap to close!

The elements are linked and aligned horizontally using **Formwork element connectors FF20/50 Z** and Connecting pins 10cm:

- fast, dropout-proof joints between elements
- additionally, the inter-element joint can be pulled tight in 2 stages
- dirt-resistant and hard-wearing for site use
- a hammer is the only tool needed



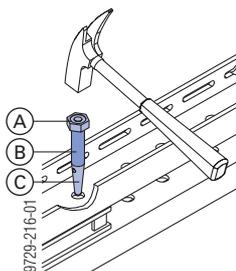
**Can be combined with Large-area formwork Top50:**

At the appropriate waling spacing, panels from the Doka timber-beam formwork range with Multi-purpose walings WS10 Top50 and Doka beams H20 top can be combined with Formwork elements FF20. This enables users to supplement the available formwork with existing equipment at short notice.

Section modulus: 21.6 cm<sup>3</sup>

Moment of inertia: 97.2 cm<sup>4</sup>

The 3 zones of the Connecting pin 10cm:



**A Head:** (hammer)

**B Shank:** (hold)

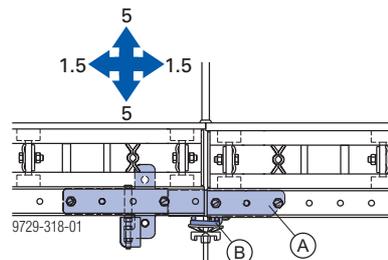
**C Cone:** (pull tight)

**NOTICE**

When the connecting pin is used in a horizontal position, secure it with a **Spring cotter 5mm**.

## Other possible types of inter-panel connection

- Formwork element connector FF20/50 - without pull-tight function
- Anchoring plate FF20/50 - without pull-tight function (for details of how to use on inside corners, see the section headed '90 degree corners')
- Splice plate with joint adjustment - with pull-tight function (5 mm and 1.5 mm)

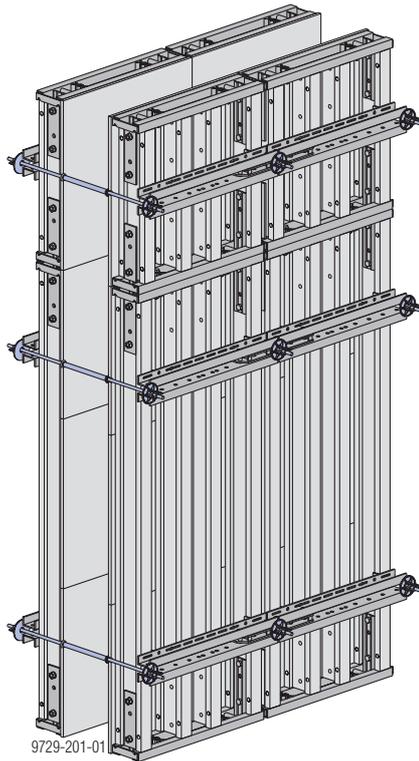


**A** Splice plate with joint adjustment

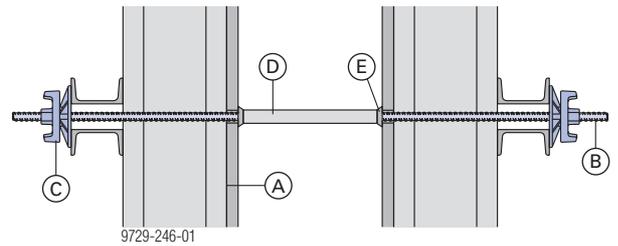
**B** Distribution plate FF20

For more information, please contact your Doka technician.

# Tie rod system



## Tie rod system 15.0

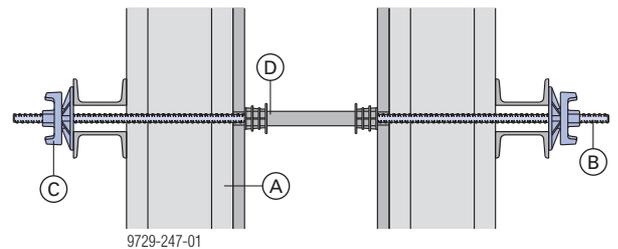


- A** Formwork element FF20
- B** Tie rod 15.0mm
- C** Super plate 15.0
- D** Plastic tube 22mm
- E** Universal cone 22mm

**Note:**

The Plastic tubes 22mm are left in the concrete and are sealed off with **Plugs 22mm**.

As an alternative to the plastic tube with universal cone, Doka also offers a **distance piece** designed as an all-in-one form-tie distance tube.



- A** Formwork element FF20
- B** Tie rod 15.0mm
- C** Super plate 15.0
- D** Distance piece (ready-to-use for certain wall thicknesses)

The plugs for sealing the ends of each distance piece are supplied with it.

**Tie rod 15.0mm:**

Permitted capacity, allowing a 1.6 : 1 factor of safety against failure: 120 kN  
 Permitted capacity to DIN 18216: 90 kN



The friction-type ratchet SW27 or Box spanner 27 0.65m can be used for **low-noise releasing and tightening** of the following anchoring components:

- Super plate 15.0
- Wing nut 15.0
- Star grip nut 15.0



**WARNING**

Sensitive rod steel!

- ▶ Never weld or heat tie rods.
- ▶ Tie rods that are damaged or have been weakened by corrosion or wear must be withdrawn from use.



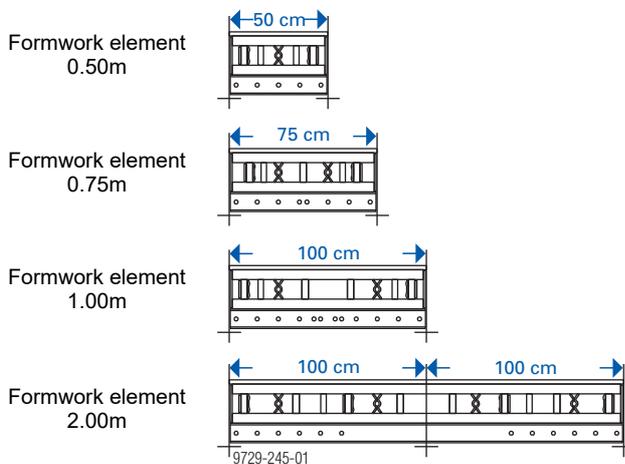
**Tie-rod wrench 15.0/20.0**

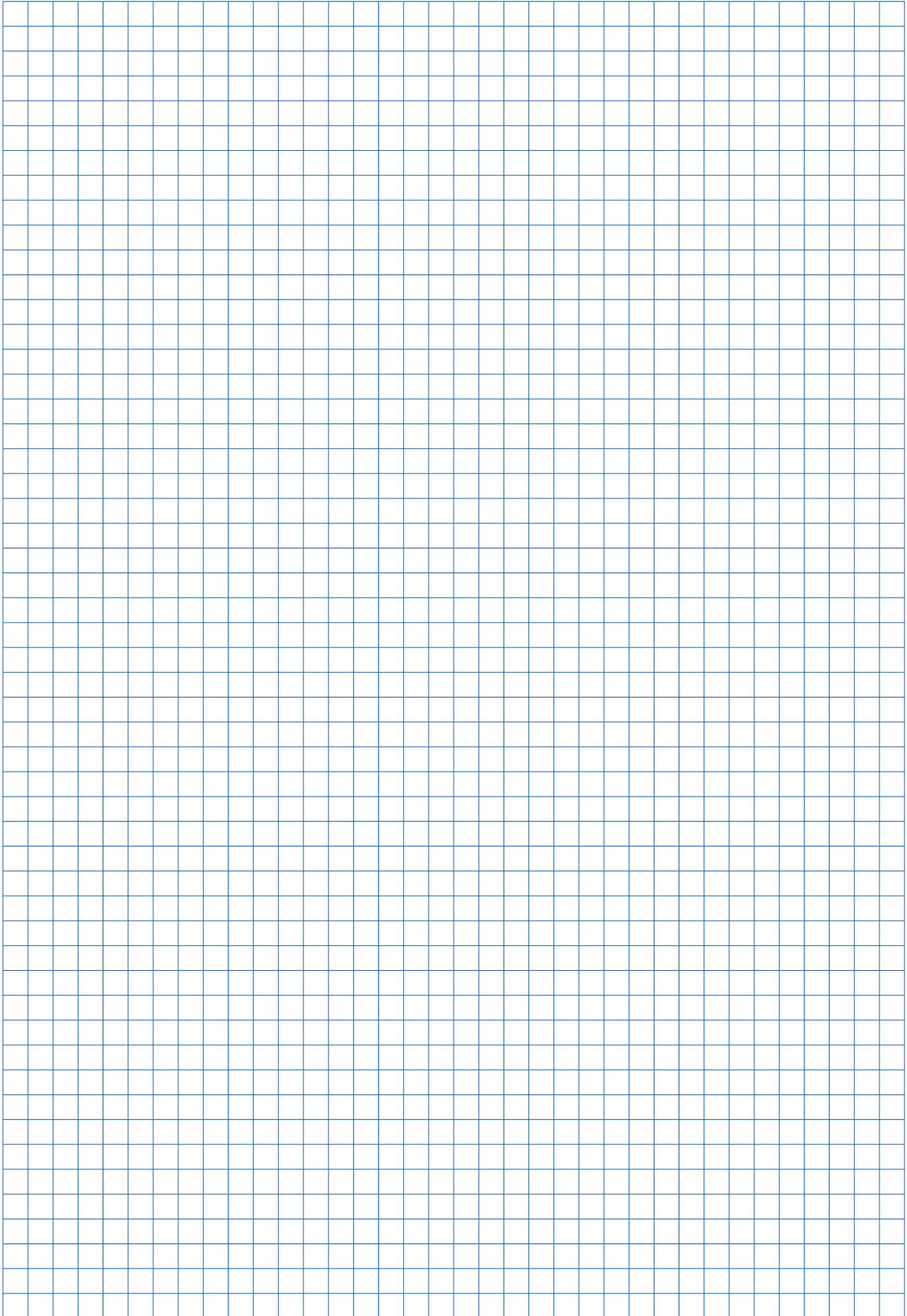
For turning and holding the tie rods.

**Note:**

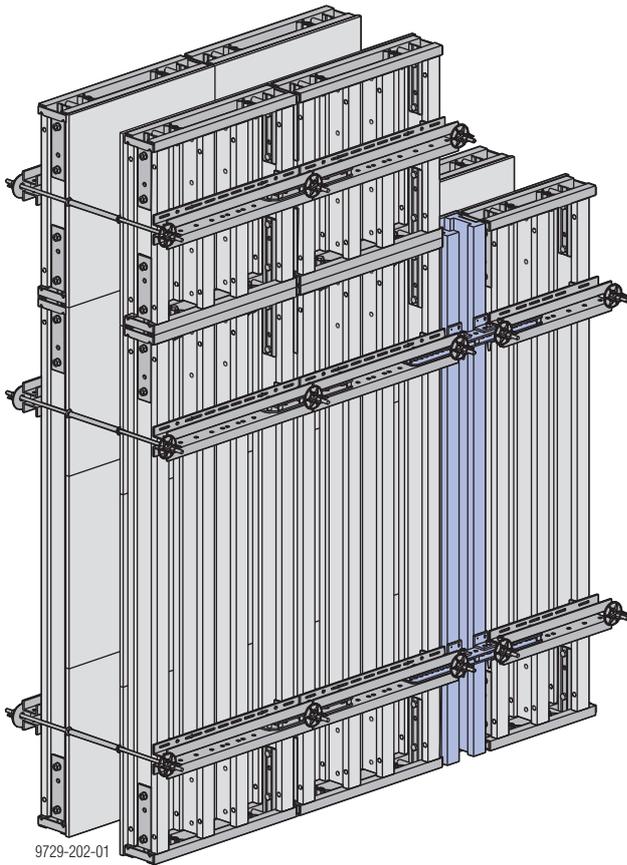
Doka also offers economical solutions for creating watertight wall-ties.

**Anchor spacing**





# Length adjustment using closures



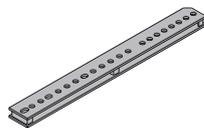
Adjustable waling extensions are used for obtaining dropout-proof and slippage-free links between the FF20 formwork elements.



**NOTICE**

When **connecting short elements to the closure zone**, watch out for possible collisions between the adjustable waling extensions and the formwork element connectors.

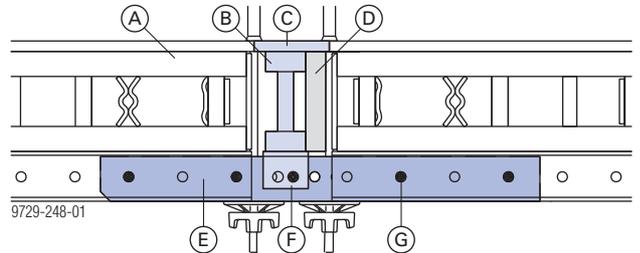
**Adjustable waling extension FF20/50:**  
 Section modulus: 21.6 cm<sup>3</sup>  
 Moment of inertia: 97.2 cm<sup>4</sup>



## For closures of up to 50 cm

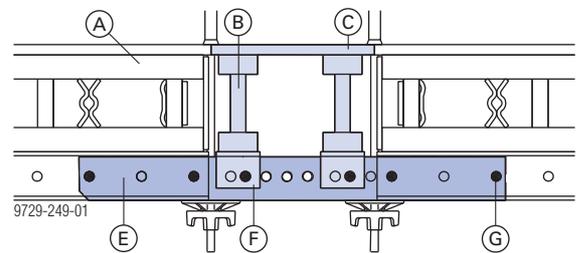
with Adjustable waling extension FF20/50 and formwork sheeting in the infill zone

### Up to 23 cm



up to 15 cm, one form tie can be left out

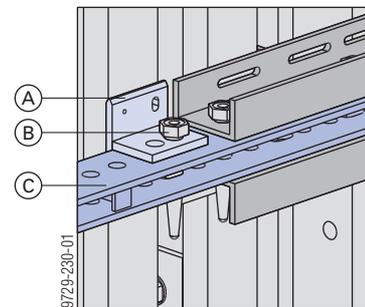
### 23 - 50 cm



- A Formwork element FF20
- B Doka beam H20
- C Doka formwork sheet
- D Nailed-on timber stud to add support to the infill
- E Adjustable waling extension FF20/50
- F Beam clamp Top50
- G Connecting pin 10cm

## Beam clamp Top50

For fastening the Doka beams H20 to the adjustable waling extensions. The beam clamp is held in place by a Connecting pin 10cm.



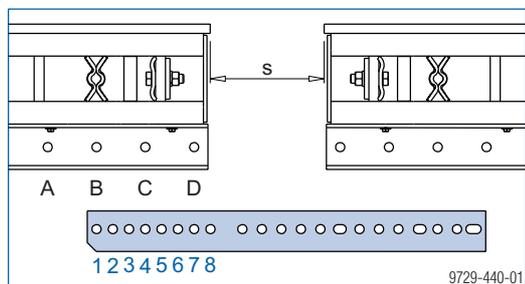
- A Beam clamp Top50
- B Connecting pin 10cm
- C Adjustable waling extension

## Determining the pin-fixing positions

**Note:**

Only the pin-fixing position on the 1st element needs to be determined.

After the 2nd element has been aligned, all the other pin-fixing positions will automatically be apparent.



Closure s [mm]	Pin-holes in waling			
	A	B	C	D
0		2	8	8
7	2	3	6	
14	3	6		
21	1	7		8
29	4	2	8	
36	2		3	6
43		3	6	
50	3	6		7
57	1	1	7	
64		2	8	8
71	2		3	6
79	3	3	6	
86	1	1	7	7
93		2	8	8
100	2		3	6
107		3	6	
114	1	1	7	7
121		2	8	8
128	1		3	6
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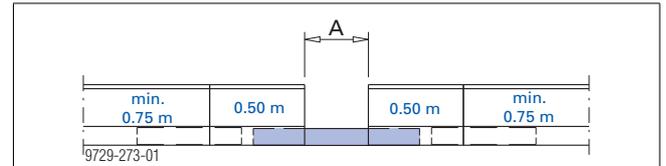
**Example:**

- Closure needed: 264 mm

**Result:**

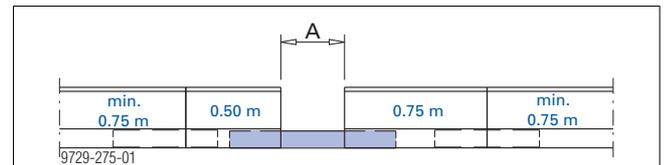
- pin-holes in waling: 'B' and 'C' or 'C' and 'D'
- pin-holes in adjustable waling extension: '3' and '6'

**Closure situations with various element combinations**

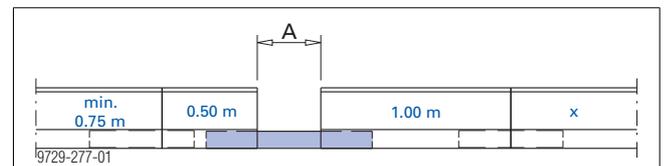


Possible closure values A [cm]

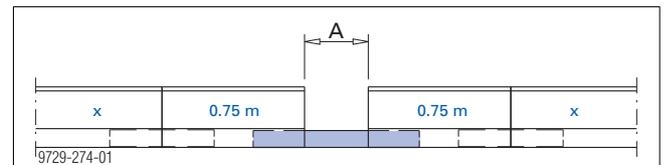
25.7	29.3	30.0	32.8	33.5	36.4
37.1	40.0	42.9	44.2	46.4	50.0



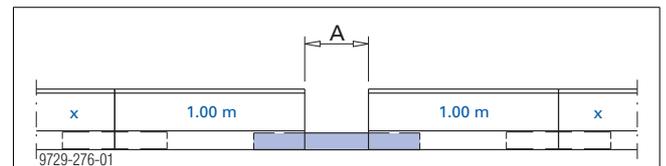
All closure values except 0.7 cm and 5.0 cm possible.



x ... any  
All closure values except 5.0 cm possible.



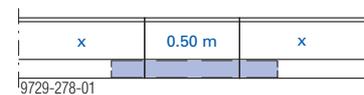
x ... any  
All closure values possible.



x ... any  
All closure values possible.



**Adjustable waling extension as bridging extension:**



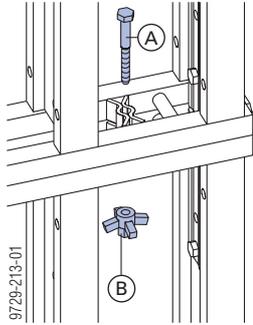
x ... any  
**With Formwork element 0.50 m:**  
Adjustable waling extension FF20/50 replaces 2 Formwork element connectors FF20.

## Vertical stacking of panels

### using Fastening bolt FF20

Two elements one on top of the other are centred and connected together by means of the Fastening bolt FF20 and the Star grip nut 15.0 G.

A turn-lock on the fastening bolt prevents it from turning as the star-grip nut is being tightened.

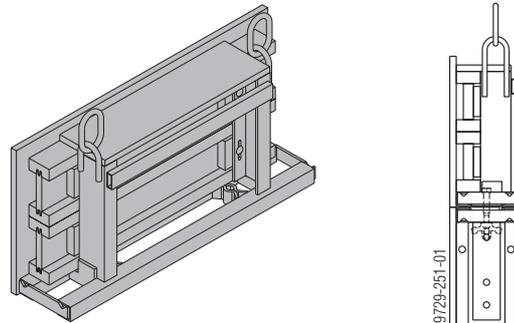


**A** Fastening bolt FF20

**B** Star grip nut 15.0 G

### up to 0.50 m

#### Configuration with 21 mm formwork sheeting

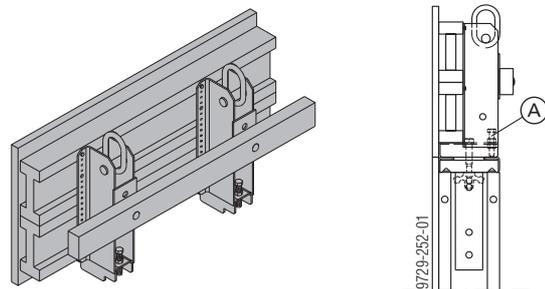


#### Stacking elements FF20-21 mm

- pre-assembled
- in all panel widths
- vertical stacking joint with Fastening bolts FF20

The stacking angle is used for on-site vertical stacking and for making inside corners of height 0.50 m.

#### Configuration with 27 mm formwork sheeting



#### Stacking elements FF20-27 mm

- pre-assembled
- in all panel widths and as inside corner
- vertical stacking joint with Fastening bolts FF20
- integral screw for precision adjustment (**A**)

The stacking angle is used for on-site vertical stacking. This is done using the stacking angle in combination with Doka beams H20 on their sides.

If there is oblique pull at the crane lifting:  
Transfer the horizontal load by attaching a squared timber 9x4.5 cm as stiffener.

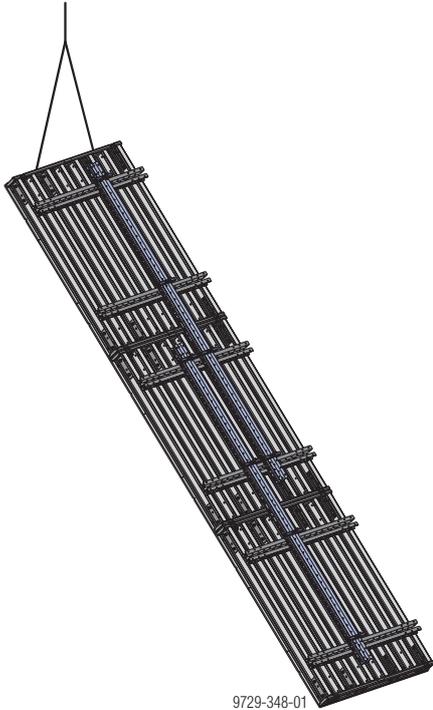
## gang-forms comprising multiple vertically stacked elements

---

**Note:**

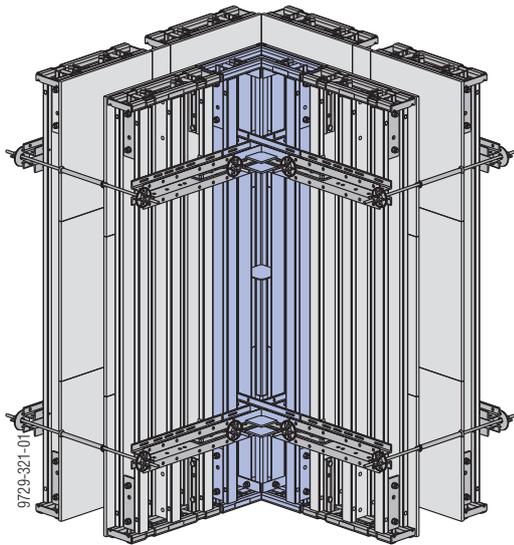
Whenever pre-assembled gang-forms consisting of vertically stacked elements have to be crane-lifted into the vertical or laid down flat, observe the following:

- If the formwork height is 6.50 m or more, stiffening with multi-purpose walings is statically required.

**NOTICE**

For the permissible total weight of each unit for repositioning, see the section headed 'Lifting by crane'.

## 90 degree corners

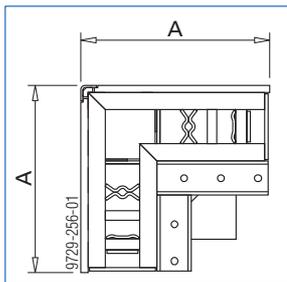


The FF20 corner solution makes forming straightforward even with different wall thicknesses up to 60 cm.

### Inside:

- pre-assembled Inside corner FF20

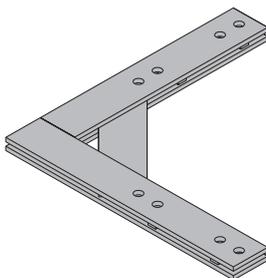
#### Inside corner FF20



Formwork sheet	Corner dimension [A]
21mm	54.9 cm
27mm	55.5 cm

### Outside:

- depending on wall thickness, with Formwork elements 0.75m or 1.00m
- Connection with strong
  - Outside angle plate FF20 21mm or, as applicable,
  - Outside angle plate FF20 27mm



- Exact adaptation to wall thickness with Adjustable waling extension FF20/50

Even when wall thicknesses differ, the elements are directly opposite each other.

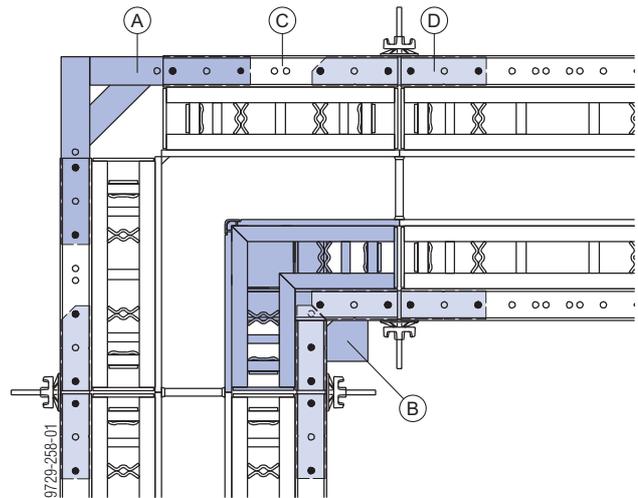


Whenever possible, form the outside corner with Formwork elements FF20 2.00m instead of Formwork elements FF20 1.00m. This makes the outside corner stronger.

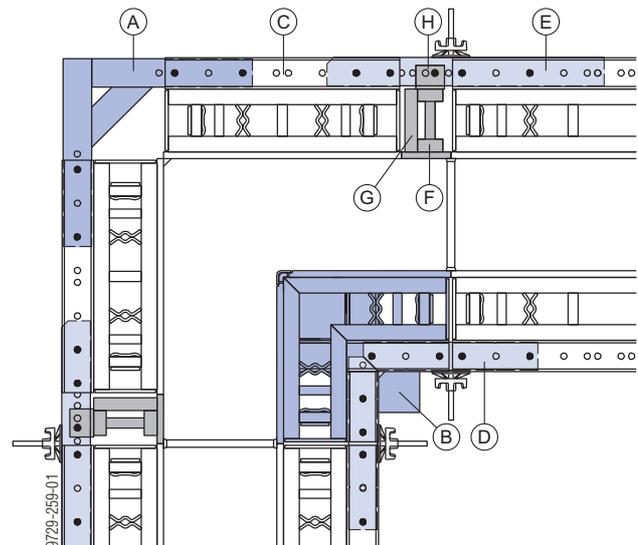
## Up to 35 cm wall thickness

with Formwork elements FF20 0.75m in the outside corner

### Wall thickness 20 cm (without closures)



### Wall thickness 20 to 35 cm (closures on outside)



**A** Outside angle plate FF20 (21 or 27mm)

**B** Inside corner FF20

**C** Formwork element FF20 0.75m

**D** Formwork element connector FF20/50 Z

**E** Adjustable waling extension FF20/50

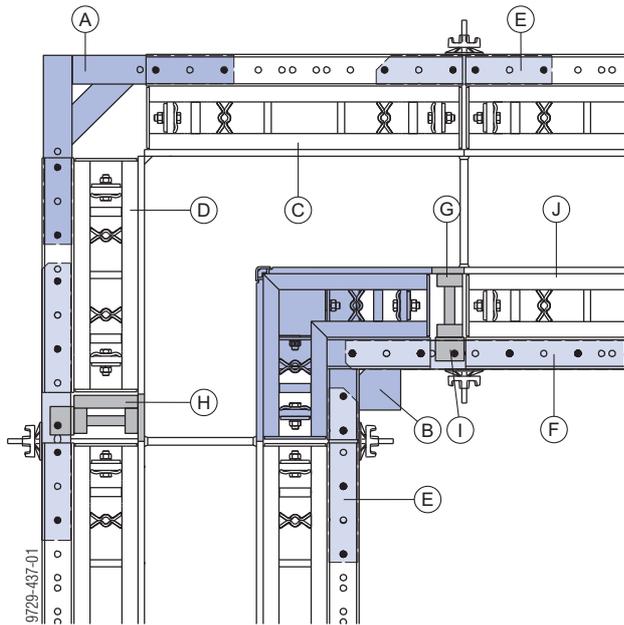
**F** Formwork sheet + Doka beam

**G** Plank

**H** Beam clamp Top50

## with Formwork elements FF20 0.75m and 1.00m in the outside corner

**Wall thickness 30 to 35 cm  
(1 closure on outside, 1 closure on inside)**



- A** Outside angle plate FF20 (21 or 27mm)
- B** Inside corner FF20
- C** Formwork element FF20 1.00m
- D** Formwork element FF20 0.75m
- E** Formwork element connector FF20/50 Z
- F** Adjustable waling extension FF20/50
- G** Formwork sheet + Doka beam
- H** Plank
- I** Beam clamp Top50
- J** Formwork element FF20  $\geq 1.00$ m



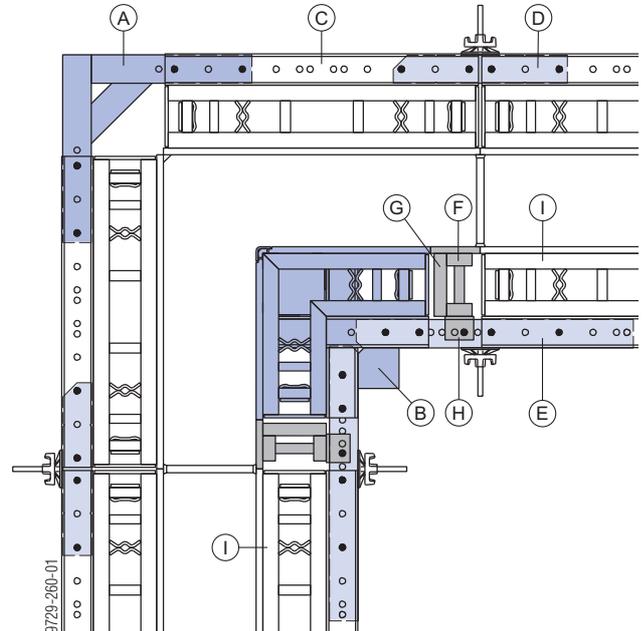
### NOTICE

If a closure is needed on the inside, the adjacent element must be at least 1.00 m wide (space needed for adjustable waling extension and formwork element connector).

## Up to 60 cm wall thickness

with Formwork elements FF20 1.00m in the outside corner

**Wall thickness 35 to 45 cm  
(closures on inside)**



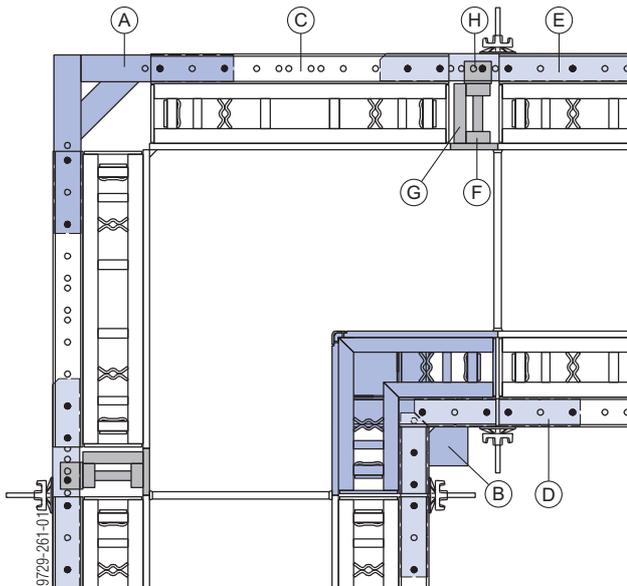
- A** Outside angle plate FF20 (21 or 27mm)
- B** Inside corner FF20
- C** Formwork element FF20 1.00m
- D** Formwork element connector FF20/50 Z
- E** Adjustable waling extension FF20/50
- F** Formwork sheet + Doka beam
- G** Plank
- H** Beam clamp Top50
- I** Formwork element FF20  $\geq 1.00$ m



### NOTICE

If a closure is needed on the inside, the adjacent element must be at least 1.00 m wide (space needed for adjustable waling extension and formwork element connector).

### Wall thickness 45 to 60 cm (closures on outside)



**A** Outside angle plate FF20 (21 or 27mm)

**B** Inside corner FF20

**C** Formwork element FF20 1.00m

**D** Formwork element connector FF20/50 Z

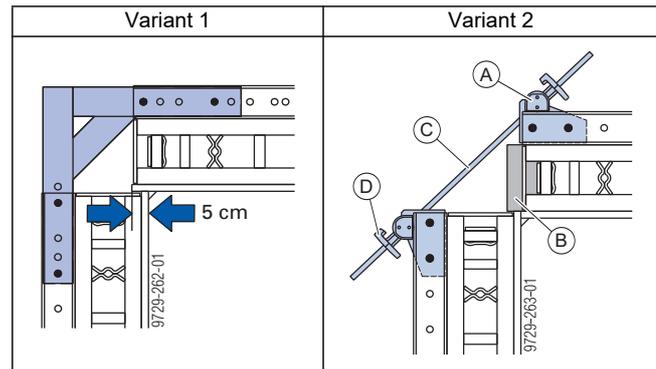
**E** Adjustable waling extension FF20/50

**F** Formwork sheet + Doka beam

**G** Plank

**H** Beam clamp Top50

## Variant outside corner configurations



**A** Universal angle tie bracket

**B** Dog

**C** Tie rod 15.0mm

**D** Wing nut 15.0

### Variant 1:

The hole grid of the Outside angle plate FF20 permits a panel offset of 5 cm. This facilitates adaptation to different wall thicknesses.

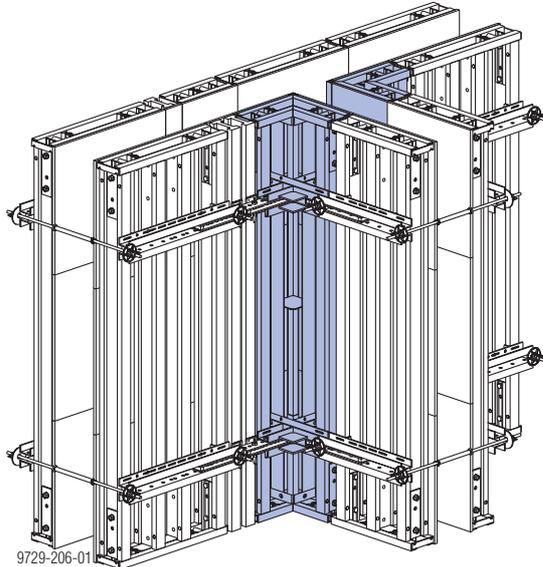
### Variant 2:

Universal angle tie brackets from the Large-area formwork Top 50 range used together with tie-rods permit diagonal tension-bracing of the elements at outside corners. The bracing angle can be varied between 23° and 64°. Two Connecting pins 10cm are needed for each Universal angle tie bracket.

## T-junction

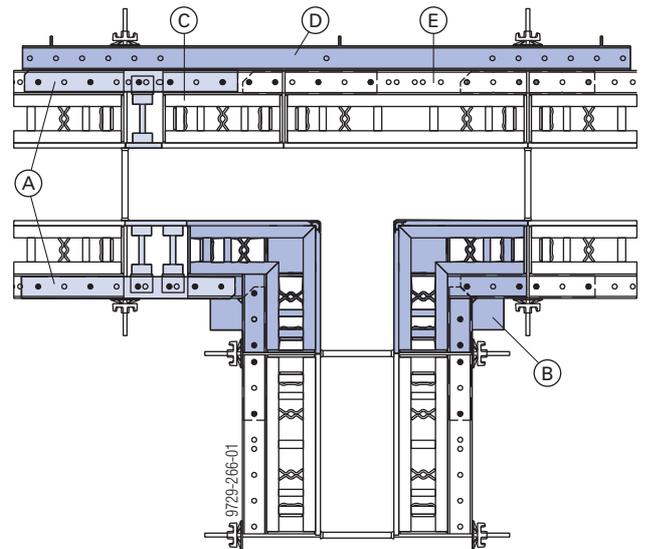
The fully assembled inside corners and the Adjustable waling extension FF20 enable the same stepless adaptation to all wall thicknesses as the corner solution. Secure tying directly in the corners is also ensured in this way.

The closure zone can be closed with formwork sheets and formwork beams.



## With bridging beam

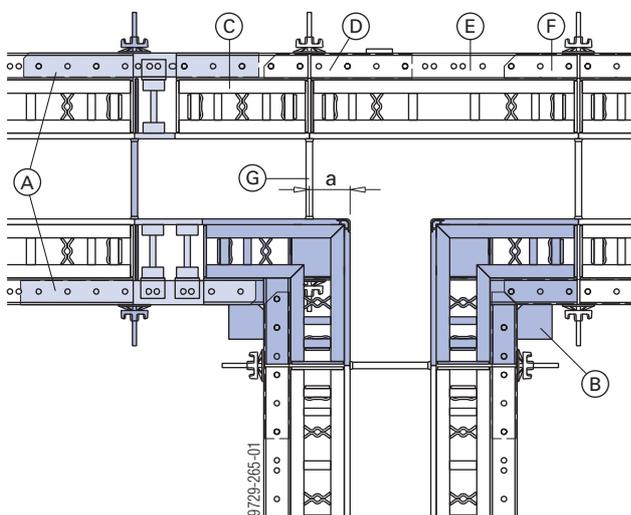
If the elements of the outside formwork are bridged with a Multi-purpose waling WS10 Top50, the additional form tie in the inside-corner area can be omitted.



- A Adjustable waling extension FF20/50
- B Inside corner FF20
- C Formwork element FF20 0.50m
- D Multi-purpose waling WS10 Top50
- E Formwork element FF20 0.75m or 1.00m (depending on wall thickness)

## With form tie through inside corner

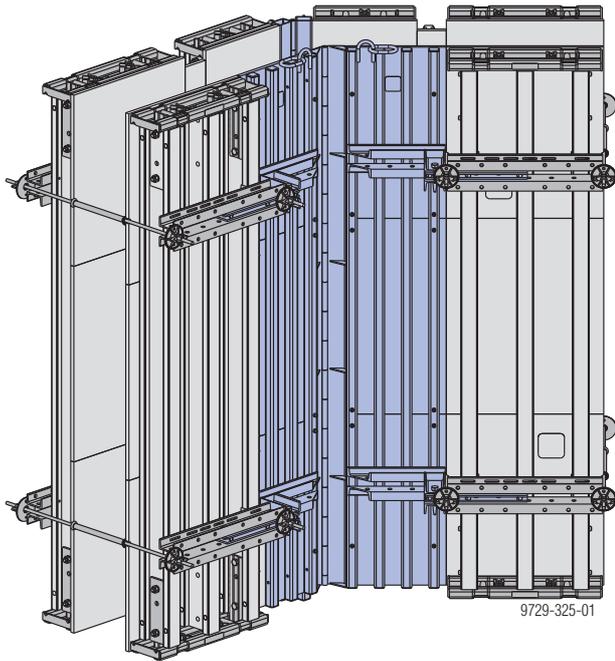
The standard T-junction is formed by installing an additional form tie in the area of the inside corner.



a ... 15 cm

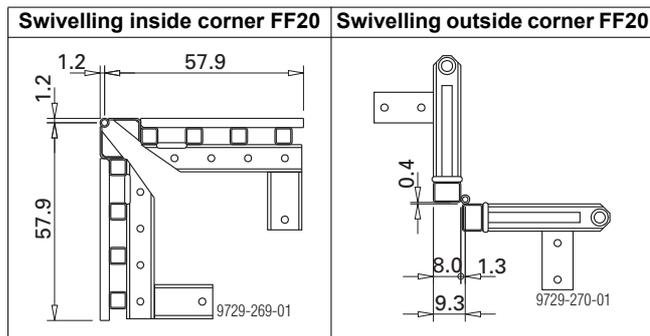
- A Adjustable waling extension FF20/50
- B Inside corner FF20
- C Formwork element FF20 0.50m
- D Anchoring plate FF20/50
- E Formwork element FF20 0.75m or 1.00m (depending on wall thickness)
- F Formwork element connector FF20/50 Z
- G additional form tie

# Acute & obtuse-angled corners

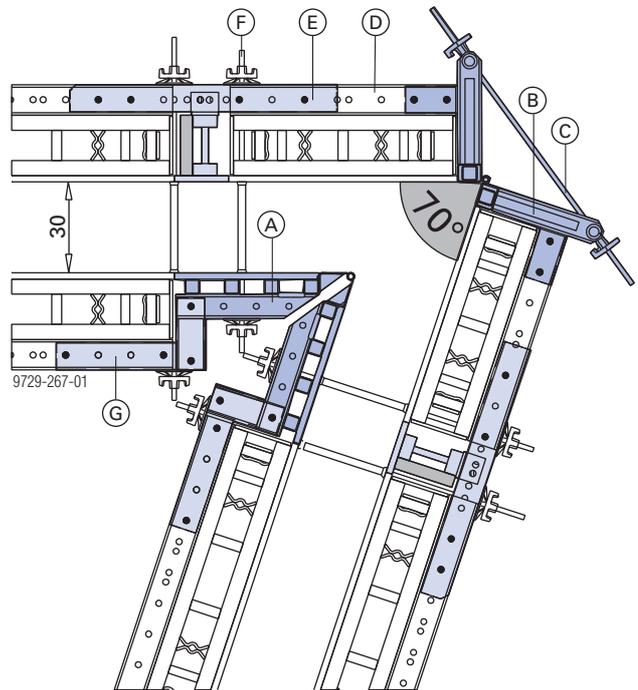


The perfect engineering of the Wall formwork FF20 also deals with acute and obtuse-angled corners. The swivelling corners make the technologically perfect solutions for challenges like this.

- Angles of between 70° and 175° are possible.

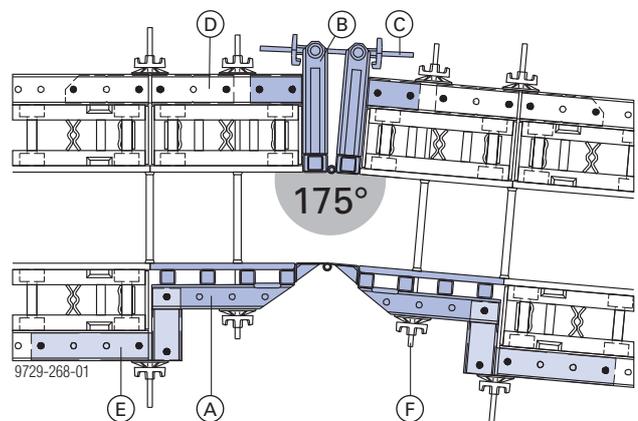


## Example: wall thickness 30 cm, angle 70°



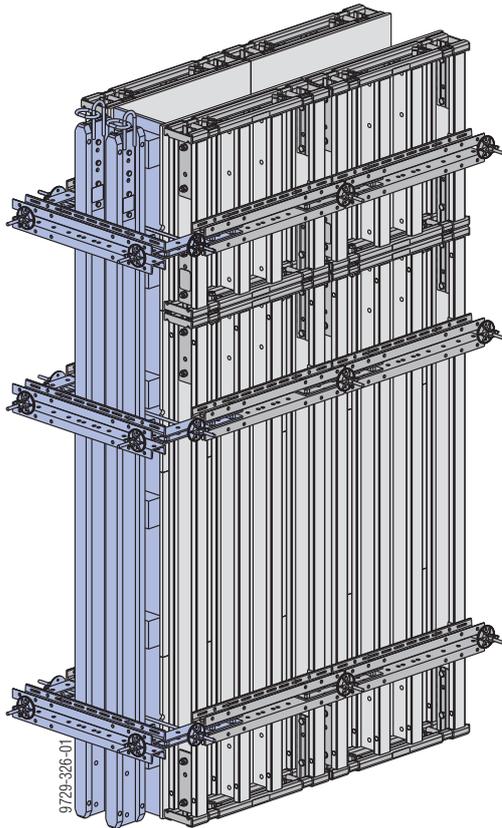
- A Swivelling inside corner FF20
- B Swivelling outside corner FF20
- C Tie rod 15.0mm
- D Formwork element FF20
- E Adjustable waling extension FF20/50
- F additional tying
- G Corner plate FF20 G

## Example: wall thickness 30 cm, angle 175°



- A Swivelling inside corner FF20
- B Swivelling outside corner FF20
- C Tie rod 15.0mm
- D Formwork element FF20 0.50m
- E Corner plate FF20 G
- F additional tying

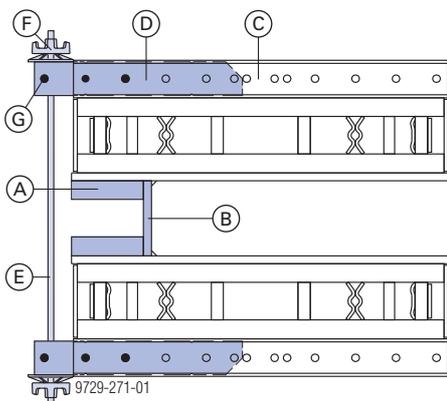
## Stop-end formwork



The Wall formwork FF20 is a complete formwork system. As such, it also offers practical solutions for e.g. the stop-end formwork.

### Walls up to approx. 20 cm thick

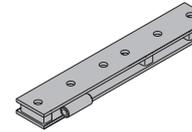
Planks are simply secured to the formwork element and a strip of formwork sheeting is inserted. Use of the formwork element connectors means that the form tie can be positioned outside the element (no drilling holes through the element).



- A Plank
- B Formwork sheet
- C Formwork element FF20
- D Formwork element connector FF20/50 Z
- E Tie rod 15.0mm
- F Super plate 15.0
- G Connecting pin 10cm

### Walls thicker than approx. 20 cm

The Multi-purpose waling WS10 Top50 is used together with Doka beams H20 and formwork sheeting. The **Anchoring plate FF 20/50** ensures that the loads are safely transferred into the waling system of the FF20 formwork elements.

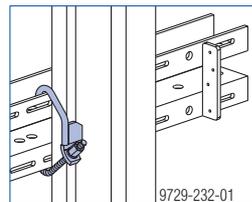


Maximum permitted load where 2 Connecting pins 10cm are used: 56 kN  
 Section modulus: 21.6 cm<sup>3</sup>  
 Moment of inertia: 97.2 cm<sup>4</sup>

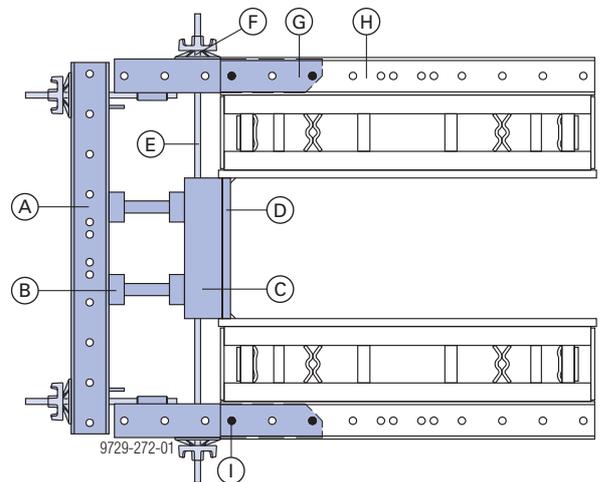
Lifting brackets enable this stop-end formwork to be repositioned as a single unit without disassembly after pouring.



The **Anchoring plate FF20/50** can also be used as a normal element connector (no pull-tight function).



With the **Flange clamps H20**, the Doka beams can be secured anywhere along the Multi-purpose waling WS10 Top50.  
 Width-across: 19mm  
 Waling clamp H20 can be used as an alternative.

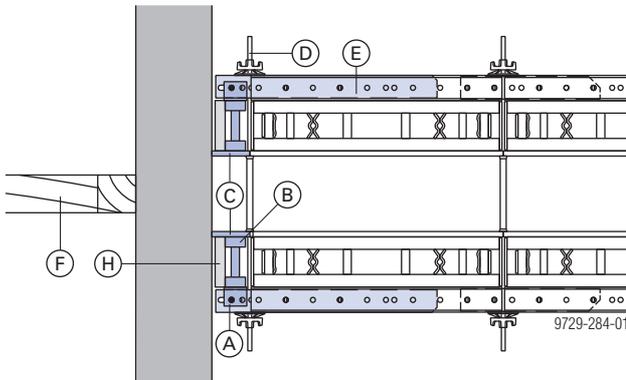


- A Multi-purpose waling WS10 Top50
- B Doka beam H20
- C Squared timber
- D Formwork sheet
- E Tie rod 15.0mm
- F Super plate 15.0
- G Anchoring plate FF20/50
- H Formwork element FF20
- I Connecting pin 10 cm

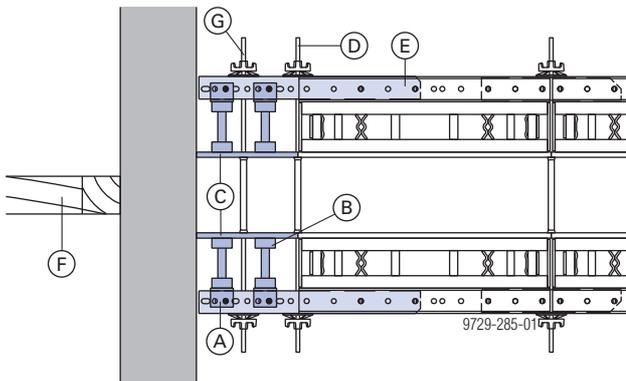
# Wall junctions

## Right-angled connections

### Closure zone up to 20 cm



### Closure zone from 20 to 40 cm

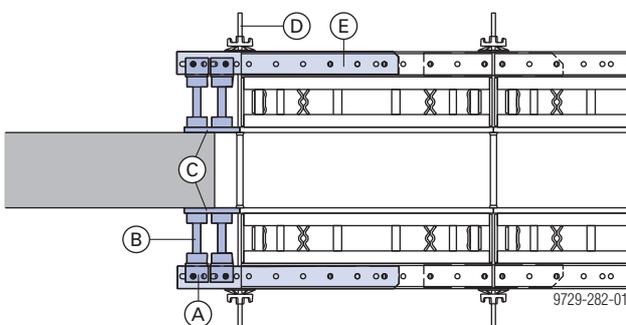


**Note:**

Up to 26 cm, no additional form tie is needed.

## In-line connections

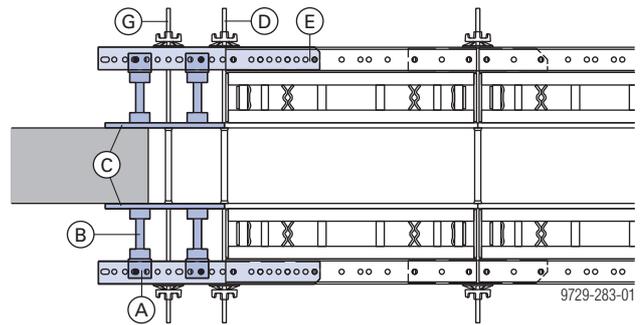
### Adjustment zone up to 26 cm wide



**Note:**

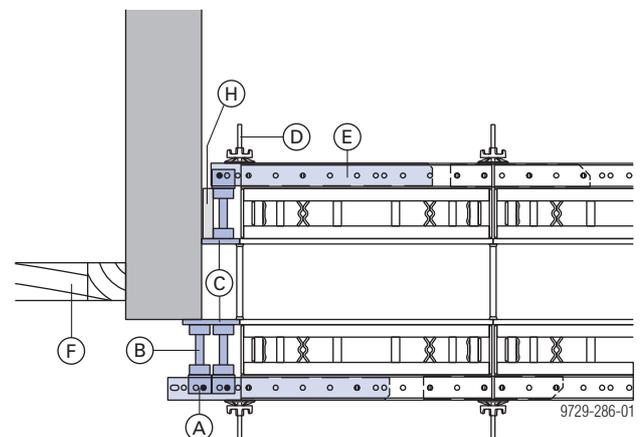
Up to 10 cm, only 1 Doka beam is needed.

### Adjustment zone from 26 to 40 cm

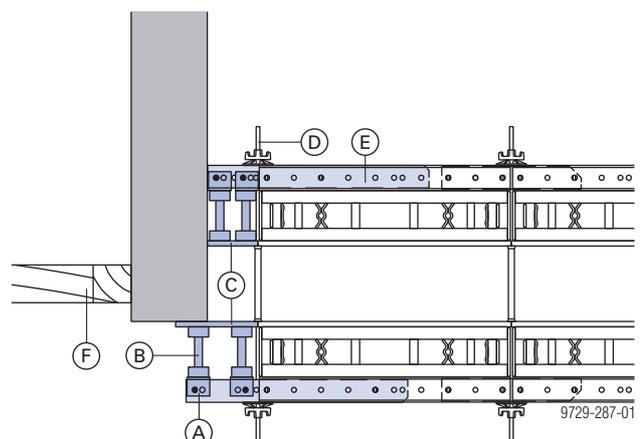


## Corner connections

### Adjustment zone up to 20 cm wide



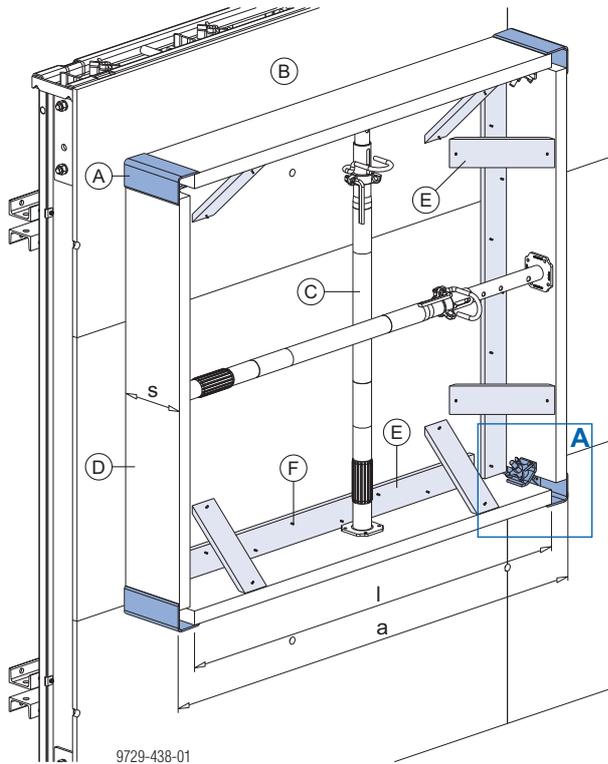
### Adjustment zone from 20 to 26 cm



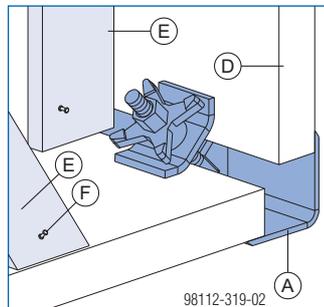
- A Beam clamp Top50
- B Doka beam H20
- C Formwork sheet
- D Tie rod 15.0mm + Super plate 15.0
- E Adjustable waling extension FF20/50
- F Timber brace
- G additional form tie
- H Plank

## Window and door openings

Window and door box-outs can be formed quickly and stripped out non-destructively with **box-out clamps**. Planks are fixed in the box-out clamps by using integrated star grip nuts.



### Close-up A:



a ... clear width of opening  
 l ... length of plank= 'a' minus 12 cm  
 s ... plank width = wall thickness

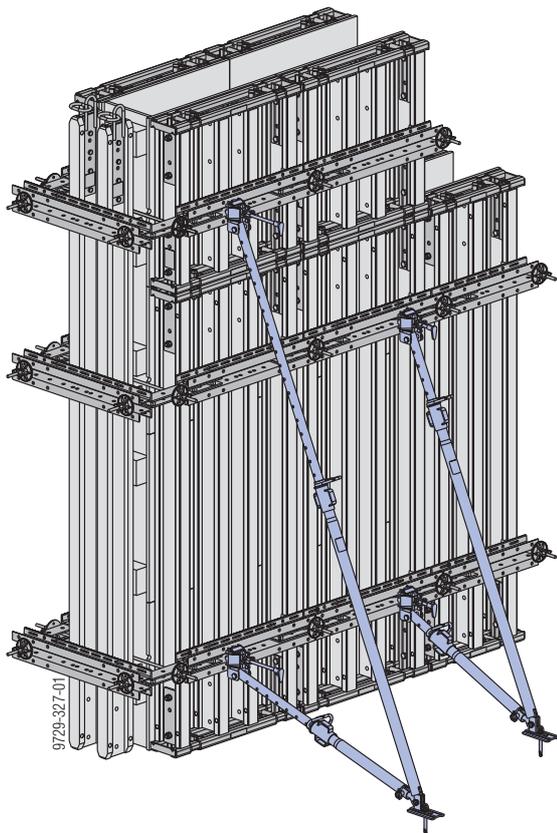
- A Box-out clamp
- B Formwork element FF20
- C Doka floor prop
- D Plank (wall thickness/2-5 cm)
- E Board (10/3 cm)
- F Double-headed nail

### Installation:

- ▶ Place the box-out clamps on the ground, fit planks into them and tighten the star grip nuts.
- ▶ Fasten the box-outs to the wall formwork with boards 10/3 cm and nails.
- ▶ Brace vertically and horizontally with suitable floor props (as statically required).

## Plumbing accessories

Plumbing accessories brace the formwork against wind loads and make it easier to plumb and align.



0.5 kN/m<sup>2</sup> (102 km/h) where  $c_{p, net} = 1.3$ . The greater wind loads encountered at exposed formwork-ends must be restrained by additional plumbing accessories (e.g. struts or pipe-braces). In cases where higher wind pressure is encountered, the number of struts must be determined by statical calculation!



For more information, see the Calculation Guide 'Wind loads to the Eurocodes', or consult your Doka technician!

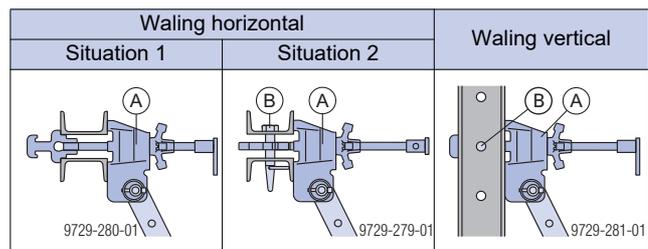
**Note:**

Every gang-form must be supported by **at least 2 plumbing accessories**.

Example: Where the formwork height is 5.50 m, the following are needed for every 4.00 m wide gang-form:

- 1 panel strut 340
- 1 panel strut 540

### Possible ways of connecting to the multipurpose waling



- A** Prop head EB
- B** Connecting pin 10cm + Spring cotter 5mm



**WARNING**

**Risk of the formwork tipping over!**

- ▶ Formwork elements must be held stable in **every phase** of construction work!
- ▶ Observe all applicable safety regulations!
- ▶ If **high wind speeds** are likely, and when work finishes for the day or before prolonged work-breaks, always take extra precautions to fix the formwork in place.

**Suitable precautions:**

- set up the opposing formwork
- place the formwork against a wall
- anchor the formwork to the ground



For more information (wind loads etc.) see the section headed 'Vertical and horizontal loads' in the Calculation Guide 'Doka formwork engineering'.

**Permitted spacings [m] of the plumbing accessories:**

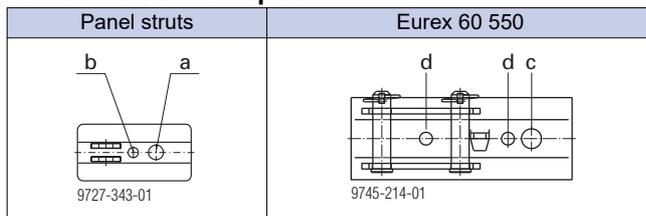
Formwork height [m]	Panel strut		Eurex 60 550
	340	540	
3.25	4.80		
4.75		3.20	
5.50	4.00	4.00	
6.00	3.20	3.00	
6.50	2.40	2.20	
7.50	3.20		4.80
8.25	4.80	2.30	4.80

The values apply where the wind pressure  $w_e = 0.65$  kN/m<sup>2</sup>. This results in an impact pressure  $q_p =$

## Fixing to the ground

- ▶ Anchor the plumbing accessories in such a way as to resist tensile and compressive forces!

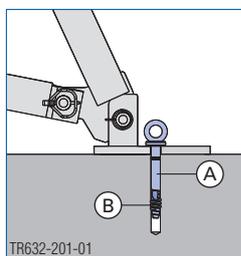
### Drilled holes in footplate



- a ... diam. 26 mm
- b ... diam. 18 mm (suitable for Doka express anchors)
- c ... diam. 28 mm
- d ... diam. 18 mm (suitable for Doka express anchors)

### Anchoring the footplate

The **Doka express anchor** can be re-used many times over.



- A** Doka express anchor 16x125mm
- B** Doka coil 16mm

Characteristic cube compressive strength of the concrete ( $f_{ck, cube}$ ):  
min. 15 N/mm<sup>2</sup> (C12/15 grade concrete)



Follow Fitting Instructions!

#### Required safe working load of alternative anchors:

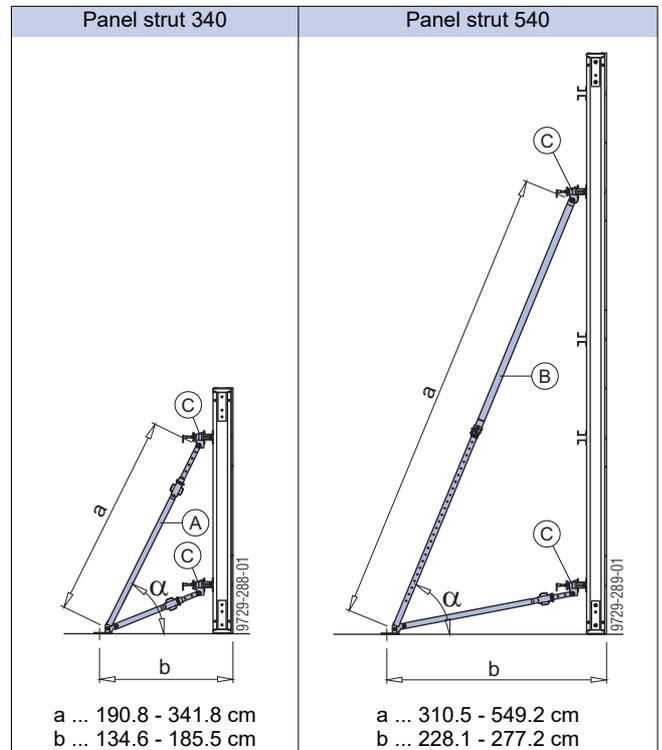
$$R_d \geq 20.3 \text{ kN} \quad (F_{\text{permissible}} \geq 13.5 \text{ kN})$$

Follow the manufacturers' applicable fitting instructions.

## Panel struts

### Product features:

- Can be telescoped in 8 cm increments
- Fine adjustment by screw-thread
- All parts are captively integrated - including the telescopic tube (has safety stop to prevent dropout)



$\alpha$  ... approx. 60°

- A** Panel strut 340 IB
- B** Panel strut 540 IB
- C** Prop head EB

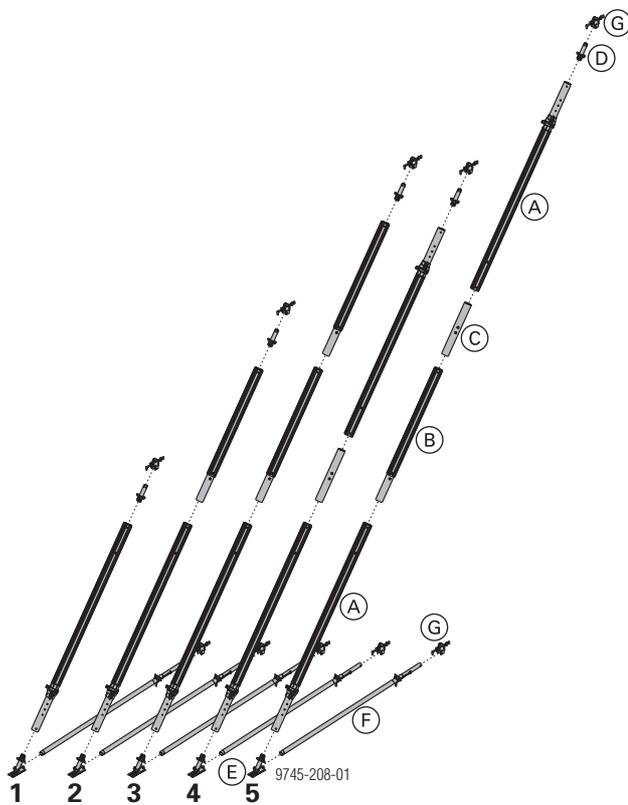
## Eurex 60 550 used as a shoring & plumbing accessory

As the Doka plumbing strut Eurex 60 550 - fitted with the appropriate accessories - this prop can also be used **for shoring high wall formwork**.

- Can be connected directly – without modification – to Doka framed formwork and Doka timber-beam formwork
- The Adjusting strut 540 Eurex 60 IB makes handling much easier, especially when the formwork is being transferred.
- Can be telescoped in 10 cm increments, with continuous fine adjustment.



Follow the directions in the 'Eurex 60 550' User Information booklet!

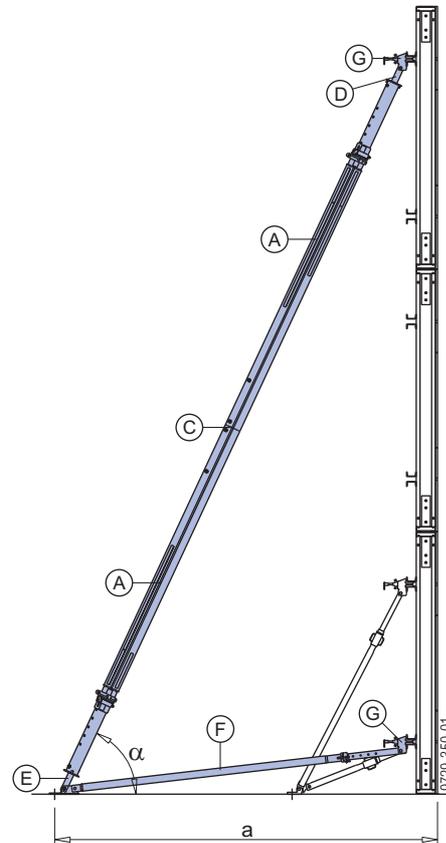


### Universal dismantling tool

For easy operation of the spindle nuts.



### Example of a possible combination of type 4



a ... 359.9 - 599.7 cm  
 $\alpha$  ... approx. 60°

- A** Plumbing strut Eurex 60 550
- C** Coupler Eurex 60
- D** Connector Eurex 60 IB
- E** Plumbing strut shoe Eurex 60 EB
- F** Adjusting strut 540 Eurex 60 IB
- G** Prop head EB

Type	Length extended L [m]	Plumbing strut Eurex 60 550 (A)	Extension Eurex 60 2.00m (B)	Coupler Eurex 60 (C)	Connector Eurex 60 IB (D)	Plumbing strut shoe Eurex 60 EB (E)	Adjusting strut 540 Eurex 60 IB (F)	Prop head EB (G)	Weight [kg]
1	3.79 - 5.89	1	—	—	1	1	1	2	91.1
2	5.79 - 7.89	1	1	—	1	1	1	2	112.4
3	7.79 - 9.89	1	2	—	1	1	1	2	133.7
4	7.22 - 11.42	2	—	1	1	1	1	2	142.5
5	9.22 - 13.42	2	1	1	1	1	1	2	163.8

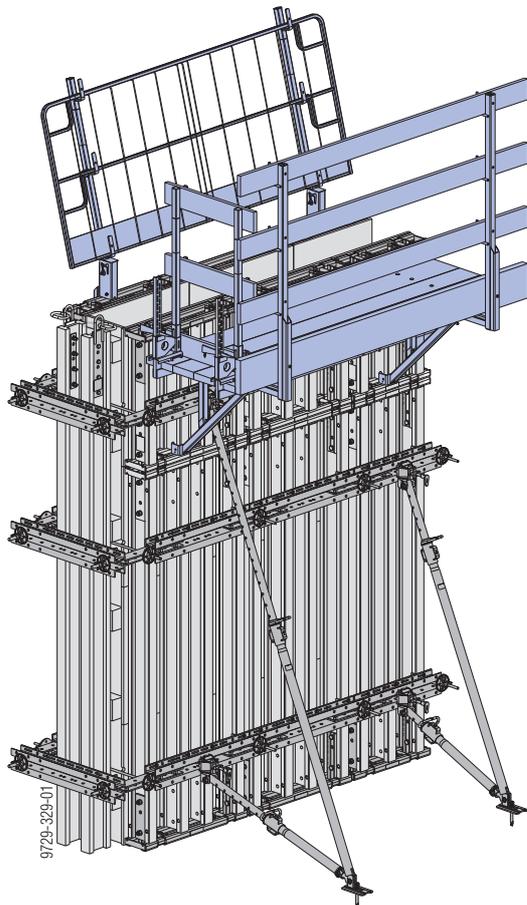
### The rule-of-thumb here is:

The length of the shoring & plumbing accessory (i.e. the complete Eurex 60 550 plumbing-strut assembly) = the height of the gang-form to be braced.

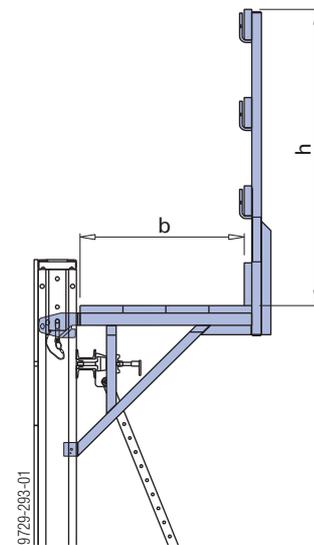
## Pouring platforms with single brackets

Doka brackets can be used to make pouring platforms that can easily be assembled by hand.

They can be attached to any point on the Doka beam. This also makes it possible to erect intermediate platforms.



## Universal brackets



	Width b	Height h
Universal bracket 90	87	160
Universal bracket 60	57	106

**Permitted service load: 1.5 kN/m<sup>2</sup> (150 kg/m<sup>2</sup>)**

Load Class 2 to EN 12811-1:2003

Max. influence width: 2.00 m

### Precondition for use

Observe all applicable safety regulations.

Only fit pouring platforms to formwork structures of adequate stability ensuring that the expected loads can be taken.

Ensure that the formwork gang is sufficiently rigid.

Brace the formwork in a windproof manner when erecting it or when it is temporarily placed in the standing position.



### NOTICE

The brackets must be secured against accidental lift-out.

### Note:

The plank and board thicknesses stated comply with the EN 338 C24 timber.

Observe all national regulations applying to deck and guardrail boards.

## Universal bracket 90

### Deck and guardrail boards

Board thicknesses for centre-to-centre spans up to 2.50 m:

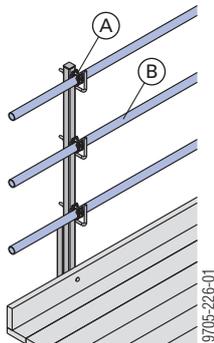
- Deck-boards min. 20/5 cm
- Guardrail boards min. 15/3 cm

**Deck-boards and guardrail boards:** Per 1 metre length of platform, 0.9 m<sup>2</sup> of deck-boards and 0.8 m<sup>2</sup> of guardrail boards are needed (site-provided).

**Fastening the deck-boards:** with 5 square bolts M10x70 and 1 square bolt M10x160 per bracket (included with product).

**Fastening the guardrail boards:** with 4 nails per bracket (not included with product).

### Using scaffold tubes



Tools required: use Fork wrench 22 for mounting the couplers and scaffold tubes.

- A Screw-on coupler 48mm 95
- B Scaffold tube 48.3mm

## Universal bracket 60

### Deck and guardrail boards

Board thicknesses for support centres of up to 2.50 m:

- Deck-boards min. 20x5 cm
- Guard-rail boards min. 15x3 cm

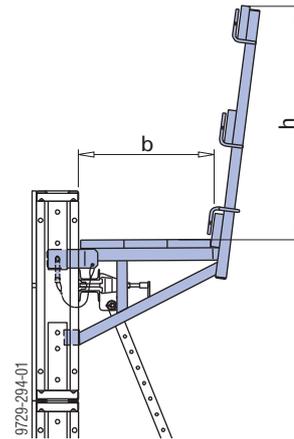
**Deck and guardrail boards:** Per 1 metre length of platform, 0.6 m<sup>2</sup> of floor decking and 0.6 m<sup>2</sup> of guard-rail boards are needed (in-situ).

**Fastening the floor decking:** with 3 square bolts M 10x120 per bracket (not included in scope of supply).

**Fastening the guard-rail boards:** Use nails

**Using scaffold tubes:** see Universal bracket 90

## Top scaffold bracket L



b ... 62 cm  
h ... 115 cm

**Permitted service load: 1.5 kN/m<sup>2</sup> (150 kg/m<sup>2</sup>)**

Load Class 2 to EN 12811-1:2003

Max. influence width: 2.00 m

### Deck and guardrail boards

Board thicknesses for support centres of up to 2.50 m:

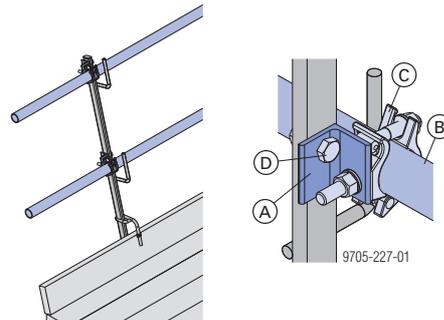
- Deck-boards min. 20x5 cm
- Guardrail boards min. 15x3 cm

**Deck and guardrail boards:** Per 1 metre length of platform, 0.65 m<sup>2</sup> of floor decking and 0.6 m<sup>2</sup> of guard-rail boards are needed (in-situ).

**Fastening the floor decking:** with 3 square bolts M 10x120 per bracket (not included with product).

**Fastening the guardrail boards:** Use nails

### Using scaffolding tubes



Tools: Fork spanner 22 for mounting the couplers and scaffolding tubes.

- A Scaffold tube connector
- B Scaffolding tube 48.3mm
- C Screw-on couplers 48mm 50
- D Hexagon screw M14x40 + hexagon nut M14 (not included with product)

## Possible ways of fixing



### WARNING

Risk of accidental lift-out if the bracket is fixed to a multi-purpose waling!

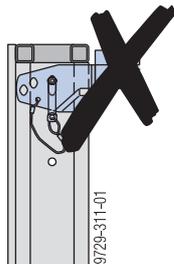
- Fix the bottom strut of every bracket with 28x60 nails or a hexagon bolt M10x140 and hexagon nut M10, on both sides of the strut.

In the multi-purpose waling (secure the bracket against accidental lift-out!)	In the bottom hole in the beam
<p>9729-312-01</p>	<p>9729-313-01</p>



### CAUTION

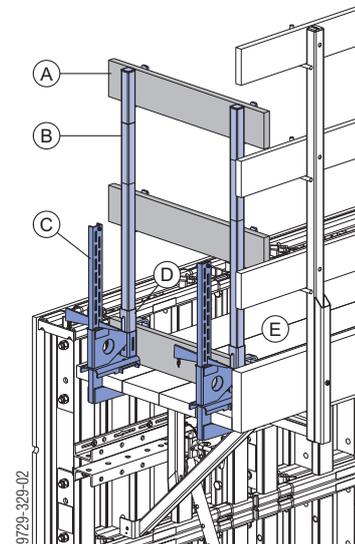
- With Formwork elements FF20, it is not permissible to hook the bracket into the topmost hole in the beam!



## Sideguards on exposed platform-ends

On pouring platforms that do not completely encircle the structure, suitable sideguards must be placed across exposed end-of-platform zones.

### Edge protection system XP



- A Guard-rail board min. 15x3 cm (site-provided)
- B Handrail post XP 1.20m
- C Railing clamp XP 40cm
- D Toeboard holder XP 1.20m
- E Pouring platform

#### How to mount:

- Fasten Railing clamps XP onto the decking of the pouring platform, by tightening the wedge (clamping range 2 to 43 cm).
- Working from below, push a Toeboard holder XP 1.20m onto the Handrail post XP 1.20m.
- Push the Handrail post XP 1.20m into the post-holding fixture on the Railing clamps XP until the locking mechanism engages.
- Fix guard-rail boards to the handrail post plates with nails (diam. 5 mm).

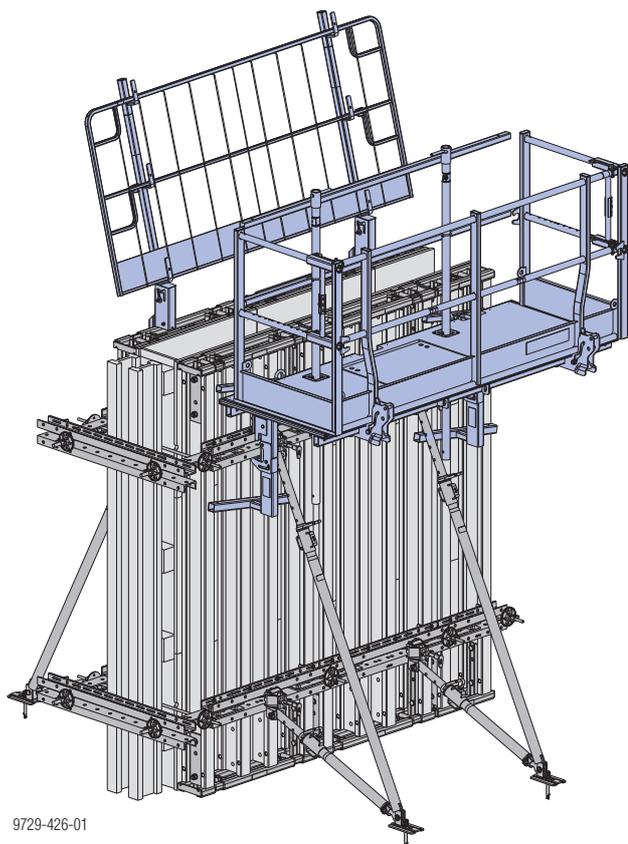
### Handrail clamp S



Follow the directions in the "Handrail clamp S" User information!

## Pouring platforms

can be quickly readied for use, and make concreting both easy and safe.

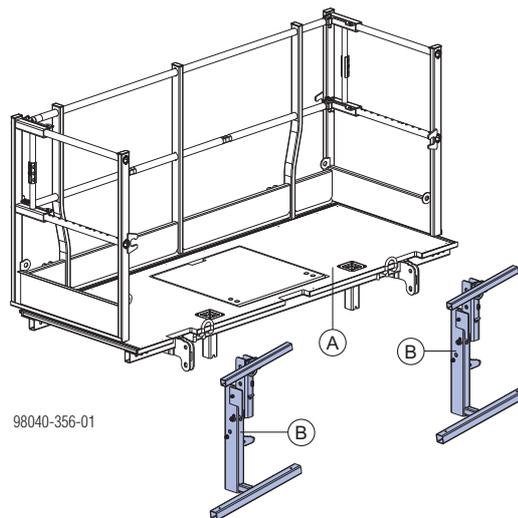


## Xsafe plus platform

These pre-assembled, fold-out working platforms with their integral side railings, self-closing man-hole lids and integrable ladders are ready for immediate use and greatly improve workplace safety.

### Note:

For detailed information on platform sizes, handling and accessories, see the section headed 'Wall formwork with Platform system Xsafe plus'.



**A** Xsafe plus platform

**B** Xsafe plus lifting adapter for beam formwork (2 adapters per platform)

**Permitted service load: 1.5 kN/m<sup>2</sup> (150 kg/m<sup>2</sup>)**

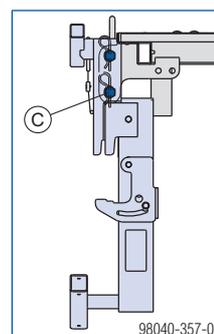
Load Class 2 to EN 12811-1:2003

**Preconditions** for using the Xsafe plus platform with the Xsafe plus lifting adapter:

- max. one platform level
- max. element height when assembled face-down on the ground, with a gang-form width of 2.00m: 6.50m

### Mounting the lifting adapter onto the platform:

- ▶ Use Connecting pins 10cm and Spring cotters 5mm to mount the lifting adapter to the platform.



**C** Connecting pin 10cm and Spring cotter 5mm of the Xsafe plus platform

### Preconditions for use:

Only fix the pouring platform onto formwork constructions that are sufficiently stable to transfer the expected loads.

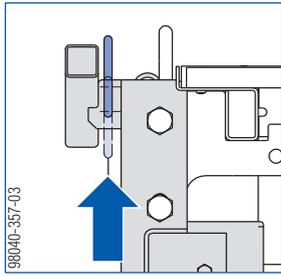
Shore the formwork in a windproof manner when erecting it and when it is temporarily placed in the standing position.

Ensure that the formwork gang has sufficient stiffness.

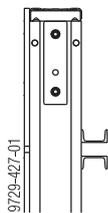
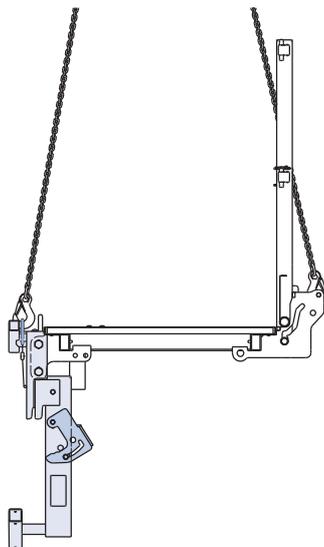
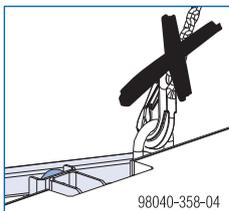
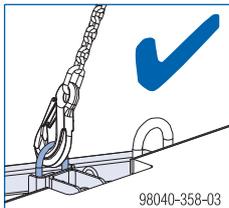
Observe all applicable safety regulations.

**Lifting the platform onto the formwork:**

- ▶ Lift the lifting bracket by hand to easily attach the Doka 4-part chain.



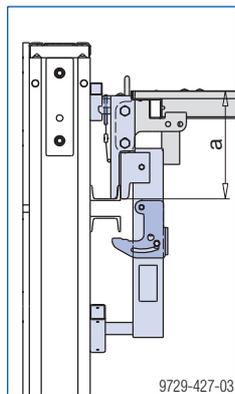
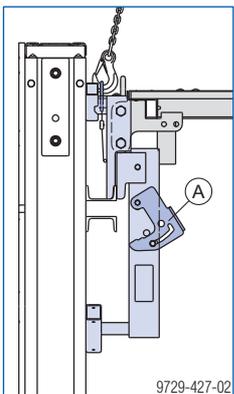
- ▶ Attach a four-part lifting chain (e.g. Doka 4-part chain 3.20m) to the platform and hoist it towards the formwork.



- ▶ Fix the platform in the top waling.
- ▶ Detach the four-part lifting chain. The securing hooks latch into place automatically.

 Do a sight-check to make sure that the securing hooks have latched into place!

The platform is now secured against accidental lift-out.



a ... 358 mm (distance between platform decking and multi-purpose waling)

**A** Securing hook

**Lifting the platform off the formwork:**

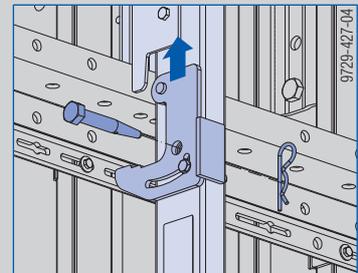
- ▶ Attach a four-part lifting chain to the platform and raise it. When the platform is raised by the four-part lifting chain on the securing hook, the platform is automatically unlocked.

 Do a sight-check to make sure that the securing hooks have been unlocked!

**Extending the platform to either side**

The platform can be lengthened at either end by using the **Xsafe plus platform extension 0.60m**.

- CAUTION**  Platforms with platform extensions can tip up. Falling hazard!
- ▶ Do not step onto the **platform extension** until the securing hooks have been fixed in place.
  - ▶ **Fix the securing hooks** of both Lifting adapters in place with the Connecting pins 10cm and the Spring cotters 5mm.



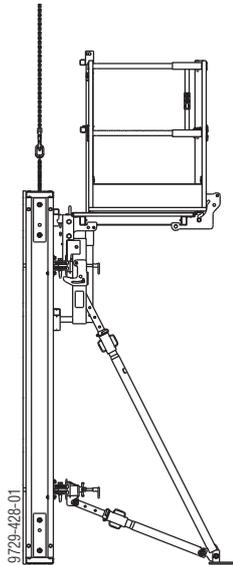
## Moving the formwork and the platform in one piece

The formwork and the Xsafe plus platform can be moved / lifted in one piece.

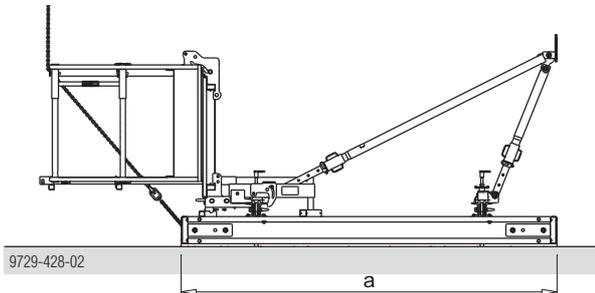
### ! NOTICE

If the formwork is lifted with the pouring platform still mounted to it, the platform must be secured so that it cannot slip to either side.

### Repositioning:



### Lifting / laying down:



a ... max. 6.50m

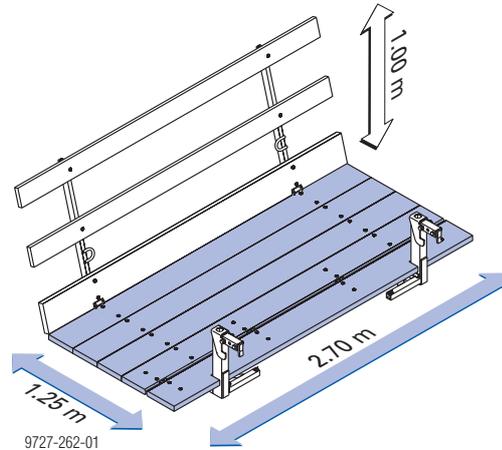
### ! CAUTION

It is not permitted to lift or lay down formwork units with heights of >6.50m!

➤ In these cases, remove the platform before lifting / laying down the formwork.

## Framax pouring platform U 1.25/2.70m

A pre-assembled, foldable, ready-to-use platform, 1.25 m wide, for convenient and safe working.



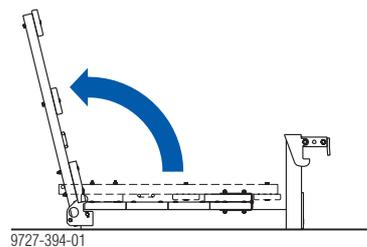
**Permitted service load: 1.5 kN/m<sup>2</sup> (150 kg/m<sup>2</sup>)**  
Load Class 2 to EN 12811-1:2003

### ! NOTICE

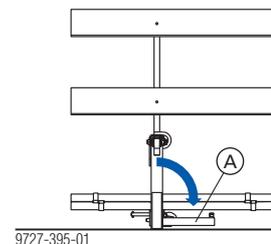
- If the formwork is lifted with the pouring platform still mounted to it, the platform must be secured so that it cannot slip to either side.
- It is not permissible to lay the formwork down flat together with the pouring platform!
- Planks can be used to bridge decking-to-decking gaps up to 50 cm for length adaptation. Minimum plank overlap 25 cm.

### Preparing the pouring platform:

➤ Tilt up the guard rails and lock them in position.



➤ Put both side stops into position.

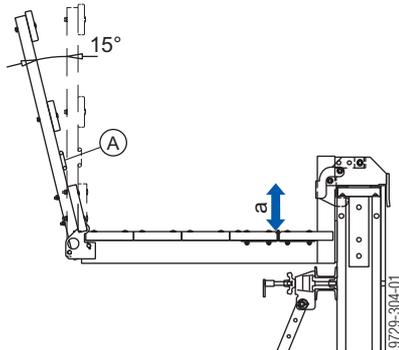


**A** Side stop

➤ Close the decking with the tilt-back board.

**with FF20 adapter**

With the **FF20 adapter**, the Framax pouring platform U can be hooked into the stacking flange of the Formwork elements FF20. 2 FF20 adapters are needed for each pouring platform.



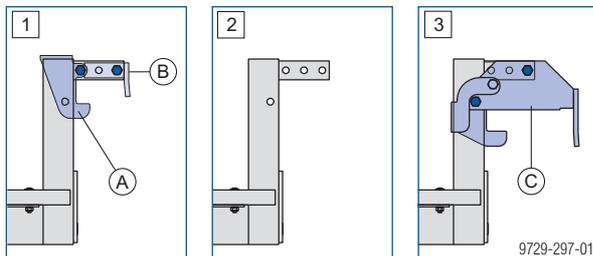
a ... 21 cm

**A** Lifting brackets

The level of the floor planking is below the top edge of the formwork. This means that there is a 'boundary' on the side facing the formwork.

**Adapting for use with FF20 formwork elements**

- ▶ Remove the securing hook and suspension hook, complete with all bolts, from the Framax pouring platform U.
- ▶ Use 2 hexagon bolts to secure each FF20 adapter to the Framax pouring platform.



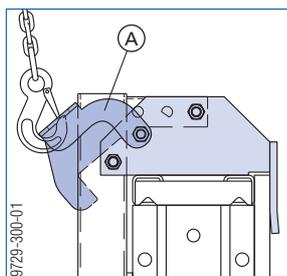
**A** Securing hook

**B** Suspension hook

**C** FF20 adapter for Framax pouring platform U

**Lifting the platform onto the formwork:**

- ▶ Attach a four-part lifting chain (e.g. Doka 4-part chain 3.20m) to the pouring platform and hoist it towards the formwork.
- ▶ Fix the pouring platform to the top of the formwork.

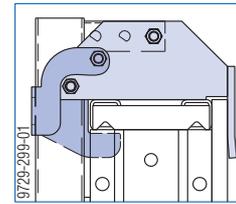


**A** Securing hook

- ▶ Detach the four-part lifting chain. The securing hooks latch into place automatically.



Do a sight check to make sure that the securing hooks have latched into place!



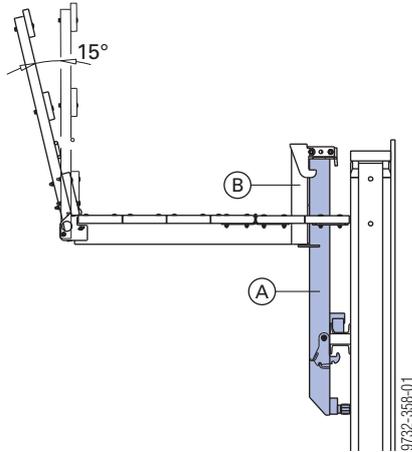
The pouring platform is now secured against accidental lift-out.

**Lifting the platform off the formwork:**

- ▶ Attach a four-part lifting chain to the pouring platform and raise it. When the pouring platform is raised by the four-part lifting chain on the securing hook, the platform is automatically unlocked.

## with Top50 adapter

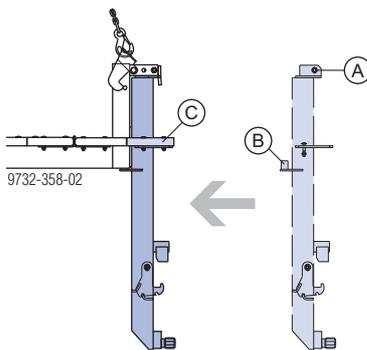
With the aid of the Top50 adapter for Framax pouring platform U, the Framax pouring platform U can be fixed in the waling of the FF20 formwork elements (2 adapters per pouring platform).



- A Top50 adapter for Framax pouring platform U
- B Framax pouring platform U

### Adapting for use with FF20 formwork elements

- ▶ Using a four-part lifting tackle, slightly raise the pouring platform.
- ▶ Remove the screw from the platform connector of the adapter.
- ▶ Push the telescopic tube of the adapter into the bottom tubular opening on the Pouring platform U.
- ▶ Replace and tighten the screw on the platform connector of the adapter.
- ▶ An extra plank can be mounted where necessary (leave recesses for the adapters).
- ▶ When you have mounted the adapters on the Pouring platform U, lay it back on the ground.

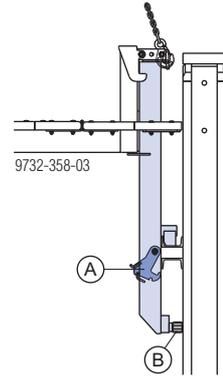


- A Bolt
- B Inner tube
- C Extra plank

### Lifting the platform onto the formwork:

- ▶ Attach a four-part lifting tackle to the hoisting points of the adapters at the front, and to the lifting brackets of the platform railings at the rear.
- ▶ Raise the safety catches of the adapters and latch them into the rear position.

- ▶ Move the supporting profiles into the horizontal and slot the Pouring platform U onto the adapters on the multi-purpose walings.



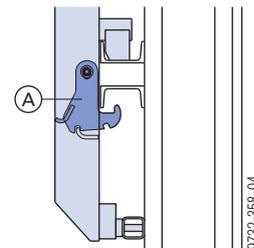
- A Safety plate
- B Supporting profile

### Secure the platform against accidental lift-out:

- ▶ Raise the safety catches and latch them into the front position (the claw grips behind the multi-purpose waling).



Check that the safety catches (A) are in the right position!



The safety catches on the adapters can be operated from ground level, using a board.

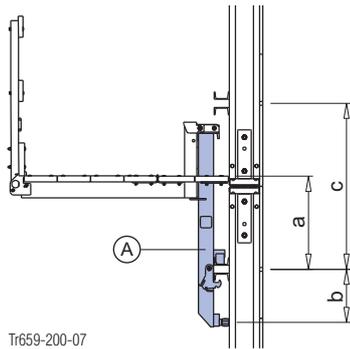
- ▶ Detach the four-part lifting tackle.

### Lifting the platform off the formwork:

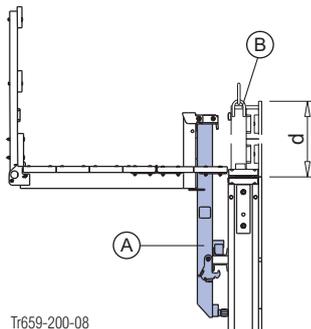
- ▶ Attach a four-part lifting tackle to the hoisting points of the adapters at the front, and to the lifting brackets of the platform railings at the rear.
- ▶ Release the safety catch by hand.
- ▶ Lift the pouring platform out of the way.

## Practical examples

### Intermediate platform



### Pouring platform



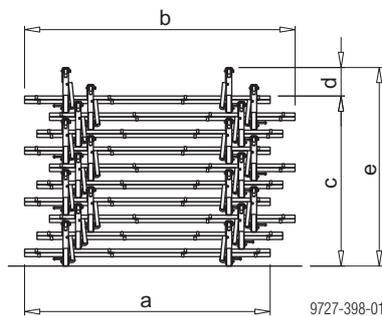
- a ... 616 mm
- b ... 382 mm
- c ... min. 1100 mm
- d ... 434 mm

- A** Top50 adapter
- B** Stacking element FF20 0.50m

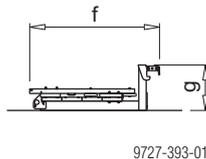
Suspension also possible on the 1.00 m high Formwork element FF20.

## Transporting, stacking and storing

Stack of 10 Framax pouring platforms U



Single collapsed platform



- a ... 268 cm
- b ... 295 cm
- c... 10 x 18.7 cm
- d... 31 cm
- e... approx. 218 cm
- f... 142 cm
- g... 50 cm

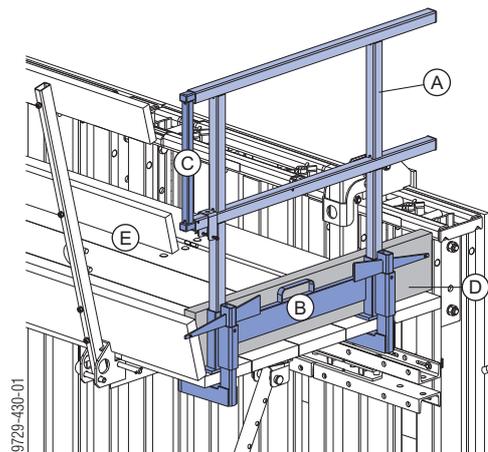
## Sideguards on exposed platform-ends

On pouring platforms that do not completely encircle the structure, suitable sideguards must be placed across exposed end-of-platform zones.

### Note:

The plank and board thicknesses stated comply with the EN 338 C24 timber.  
Observe all national regulations applying to deck and guardrail boards.

## Side handrail clamping unit T



- A** Side handrail clamping unit T
- B** Clamping part
- C** Integrated telescopic handrail
- D** Guard-rail board min. 15x3 cm (site-provided)
- E** Pouring platform

### How to mount:

- ▶ Fasten the clamping component to the floor planking of the pouring scaffold, using the wedge (clamping range 4 to 6 cm).
- ▶ Slot in the railing.
- ▶ Extend the telescopic railing to the desired length and secure it.
- ▶ Insert toeboard (guard-rail board).

## Opposing guardrail

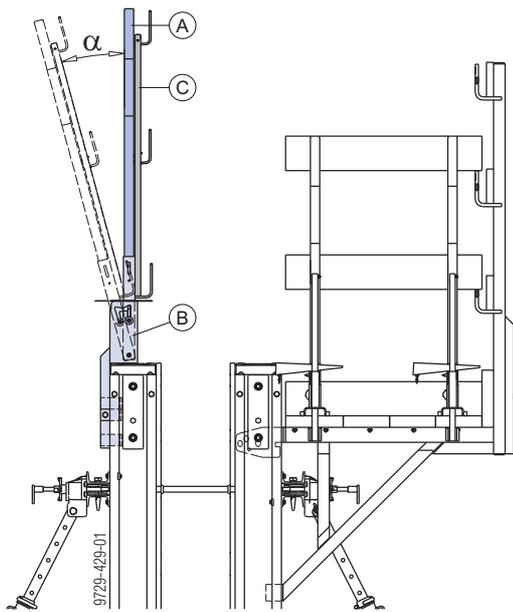
If there are work platforms mounted on one side of the formwork only, then a fall-protection barrier must be mounted to the opposing formwork.

**Note:**

The plank and board thicknesses stated comply with the EN 338 C24 timber..

Observe all national regulations applying to deck and guardrail boards.

## Edge protection system XP

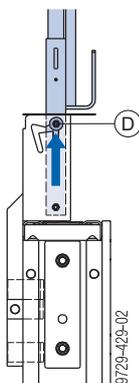


$\alpha \dots 15^\circ$

- A** Handrail post XP 1.20m
- B** Timber-beam formwork adapter XP
- C** Protective grating XP or guardrail boards

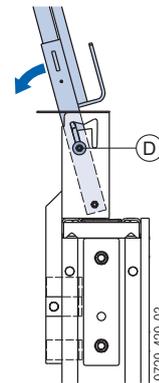
**If necessary (e.g. to enlarge the available work-space during pouring), the safety barrier can be tilted outward by 15°.**

- ▶ Push up the safety bolt on the Adapters XP until the spring snaps into place (allow for overlap between protective gratings and/or guardrail boards).



- D** Safety bolt

- ▶ Tilt the safety barrier outward.



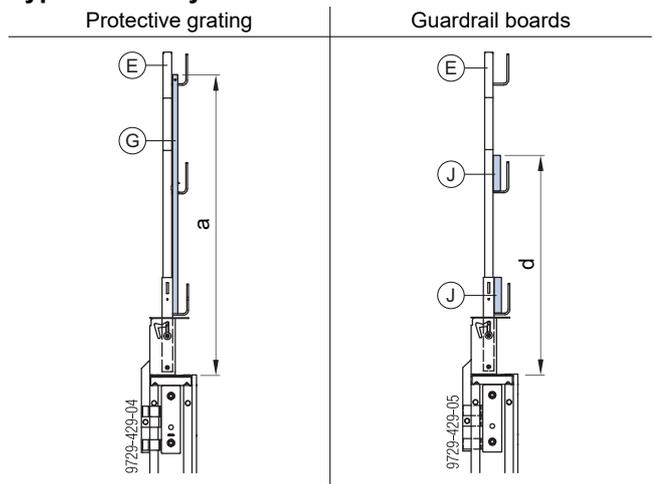
- D** Safety bolt

The safety bolt now automatically drops and secures the tilted barrier unit.



Do a sight-check to make sure that the safety bolt is in the correct position!

**Types of safety barrier:**



a ... 143 cm  
d ... 103 cm

- E** Handrail post XP 1.20m
- G** Protective grating XP
- J** Guardrail board



**NOTICE**

When guardrail boards are used to make the safety barrier, it is not allowed to fit guardrail boards in the top railing shackles.

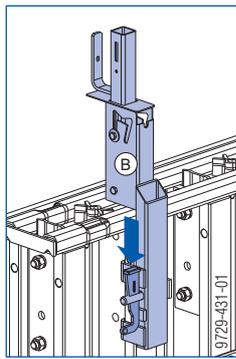
## Assembly

The opposing guard-rail can be mounted to both upright and face-down (ground-assembled) gang-forms.

### Note:

It is not possible to mount it to Stacking elements FF20 or to upside-down Formwork elements FF20.

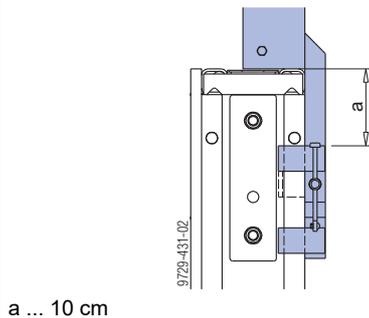
- ▶ Mount the Timber-beam formwork adapter XP to the FF20 formwork element, fixing it on firmly with the wedge.



**B** Timber-beam formwork adapter XP

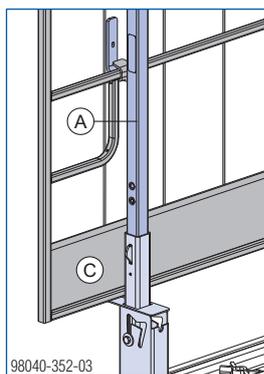


Make sure that it is seated correctly and making full-surface contact (10 cm from clamping part to beam end)!



a ... 10 cm

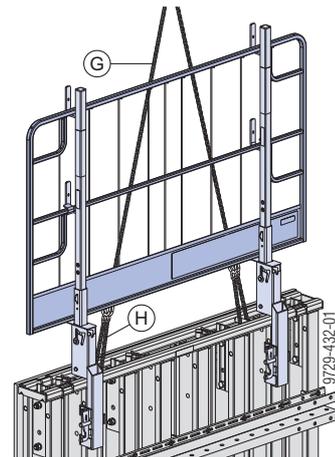
- ▶ Push the Handrail post XP 1.20m into the post-holding fixture on the Timber-beam formwork adapter XP until the locking mechanism engages.
- ▶ Fit on a Protective grating XP or guardrail boards.
- ▶ Use Velcro® fasteners 30x380mm to secure the Protective gratings XP to the Handrail posts XP, or use nails (diam. 5 mm) to secure guardrail boards.



**A** Handrail post XP 1.20m

**C** Protective grating or guardrail boards

## Lifting by crane

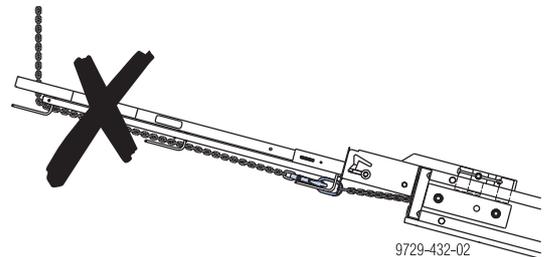


**G** Doka 4-part chain

**H** Lifting chain 100cm 15kN

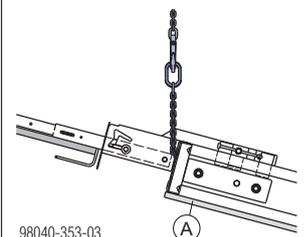
**When lifting gang-forms together with opposing guardrails assembled from the Edge protection system XP, remember the following points:**

- The guard rails must be in the vertical position when the gang-form is raised or laid down.
- Elastic deformation of the guard rails may occur because the 4-part chain is resting against the protective grating or guardrail boards while the gang-form is being lifted.
- When a gang-form is lifted, repositioned or laid down, the 4-part chain must not be led around the protective grating or the guardrail board.

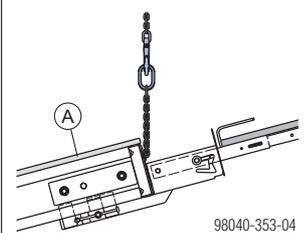


**Make sure that the 4-part chain is in the right position:**

- Placing down onto the form-ply side
- Picking up from this position

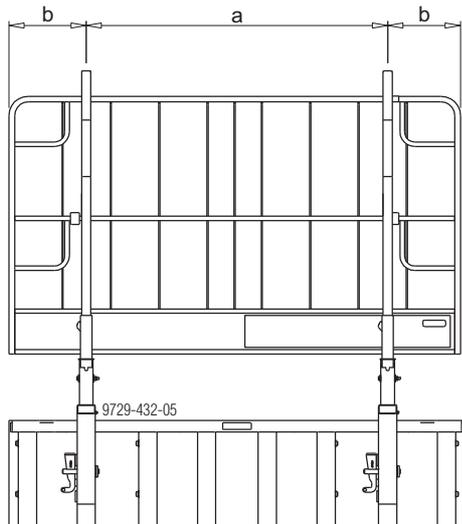


- Placing down onto the back-face of the formwork (e.g. for cleaning the form-facing)
- Picking up from the cleaning position
- Repositioning the upright gang-form



**A** Form-ply side

## Structural design



a ... support centres  
b ... cantilever

### Note:

The wind conditions likely to be encountered in Europe, in accordance with EN 13374, are largely recognised by the dynamic pressure  $q=0.6 \text{ kN/m}^2$  (highlighted in the tables).

### Permitted support centres (a)

		Dynamic pressure $q$ [kN/m <sup>2</sup> ]			
		0.2	<b>0.6</b>	1.1	1.3
Permitted support centres	Protective grating XP	<b>2.5 m</b>			-
	Guard-rail board 2.4 x 15 cm	<b>1.9 m</b>			
	Guard-rail board 3 x 15 cm	<b>2.7 m</b>	2.4 m	2.0 m	
	Guard-rail board 4 x 15 cm	<b>3.3 m</b>	2.4 m	2.0 m	

### Permitted cantilever (b)

		Dynamic pressure $q$ [kN/m <sup>2</sup> ]			
		0.2	<b>0.6</b>	1.1	1.3
Permitted cantilever	Protective grating XP	<b>0.6 m</b>		0.4 m	-
	Guard-rail board 2.4 x 15 cm	<b>0.5 m</b>			
	Guard-rail board 3 x 15 cm	<b>0.8 m</b>			
	Guard-rail board 4 x 15 cm	<b>1.4 m</b>			

## Handrail clamp S



Follow the directions in the "Handrail clamp S" User information!

## Ladder system

The Ladder system XS permits safe vertical access to and from the intermediate platforms and pouring platforms:

- when attaching/detaching the formwork to/from the crane tackle
- when opening/closing the formwork
- when placing the reinforcement
- during pouring

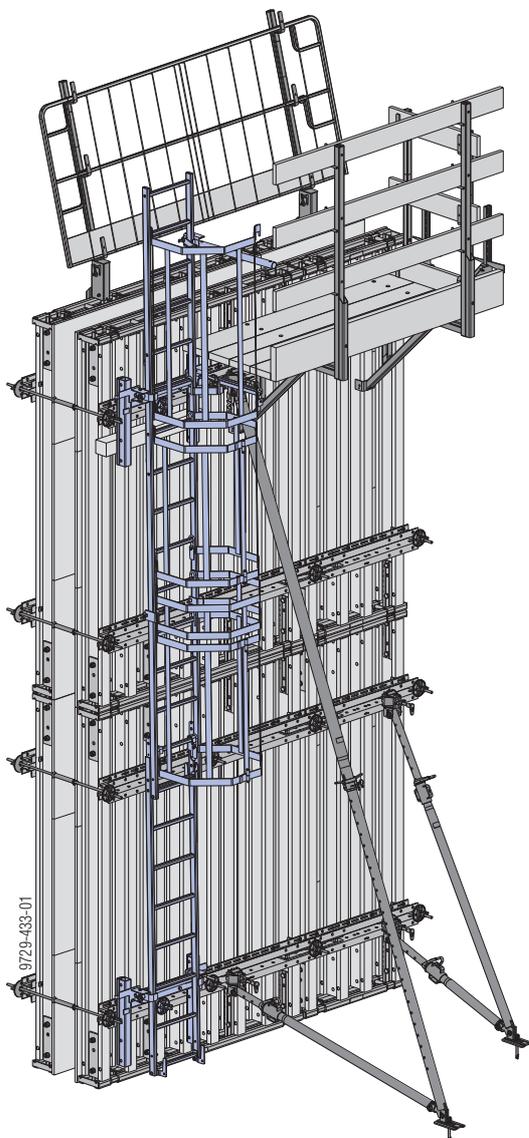
### Note:

The Ladder system XS must be implemented in such a way that all national regulations are complied with.



### WARNING

- ▶ The Ladders XS may only be used as part of the XS system, and must NOT be used separately (as 'lean-to' ladders).



## Assembly

### Preparing the formwork

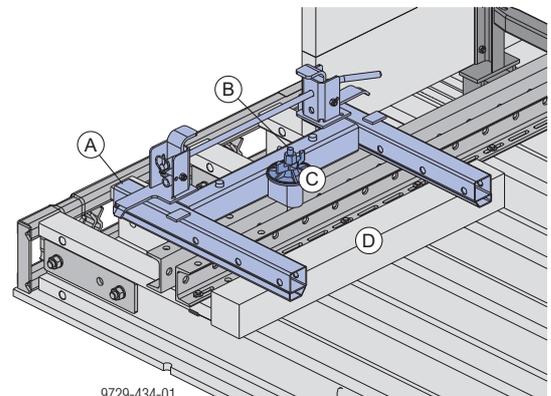
- ▶ Pre-assemble elements face-down on an assembly bench (see 'Inter-panel connections').
- ▶ Only mount the platforms and panel struts to the element when this is in the flat position (see 'Pouring platforms' and 'Plumbing accessories').

### Attaching connectors to the formwork

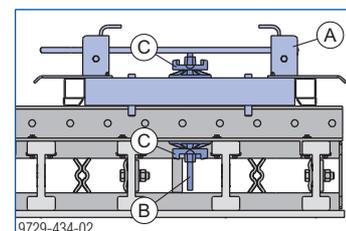


### NOTICE

- ▶ The Ladder system XS is normally mounted inside an element (i.e. not to either side of it).
- ▶ If this is not possible (e.g. because of a supporting construction frame), then a beam grille (consisting of min. 4 Doka beams) can be attached on one side of the element to make this possible. This also makes it possible to change quickly to another position.
- ▶ Place the Connector XS wall formwork onto the Multi-purpose waling near the top of the formwork and place a squared timber under it (pressure point). Nail the squared timber to the Doka beams.
- ▶ Fasten the Connector XS wall formwork to the waling with a tie-rod and 2 super plates.



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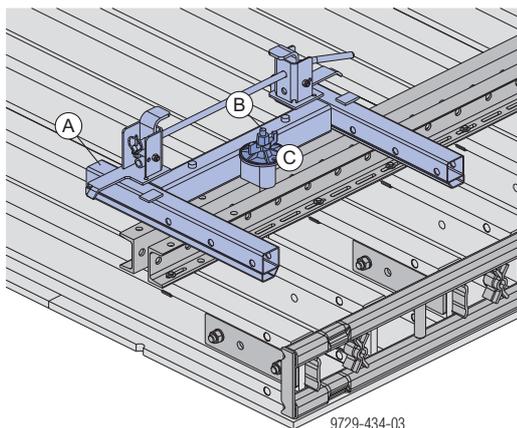


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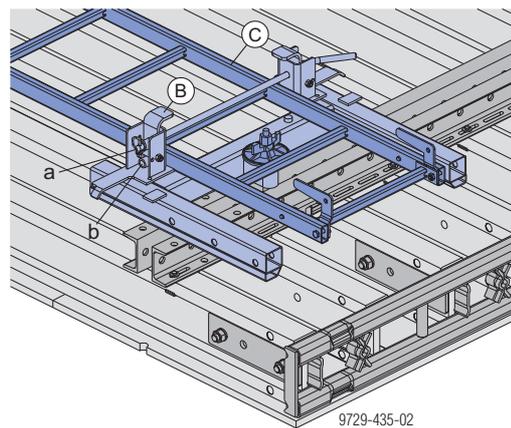
- A Connector XS wall formwork
- B Tie-rod 15.0 (Length = 0.40 m)
- C Super plate 15.0
- D Squared timber 10x10 cm (site-provided)

- ▶ Place the Connector XS wall formwork onto the Multi-purpose waling near the bottom of the formwork (no need for a squared timber).

- ▶ Fasten the Connector XS wall formwork to the waling with a tie-rod and 2 super plates.



- ▶ Close the securing hooks, re-insert the push-in bolt and secure it with a linch pin.



- A** Connector XS wall formwork
- B** Tie-rod 15.0 (Length = 0.40 m)
- C** Super plate 15.0

- in the front position (a) for one single ladder
- in the rear position (b) in the telescoping zone (for 2 ladders)

- B** Securing hooks
- C** Ladder XS

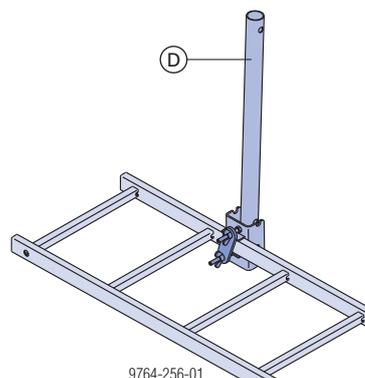
- ▶ For formwork heights above 5.85 m, an extra Connector XS Wall formwork must be attached in the same way near the middle of the formwork (i.e. approx. half-way up). This extra connector prevents the ladder swaying when site crew climb up or down it.

- ▶ Mount the Securing barrier XS to the ladder, with fixing hooks and wing-nuts.

### Fixing the ladder

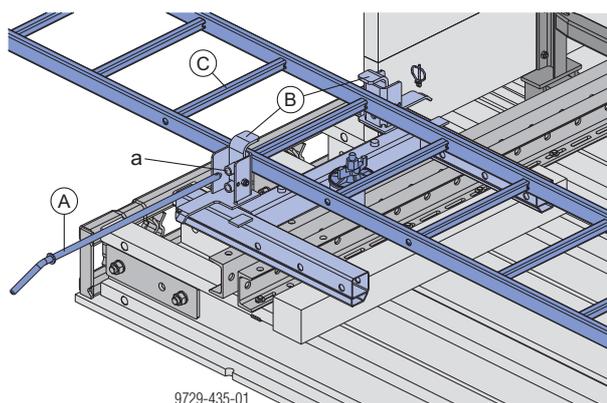
#### to the top Connector XS Wall formwork

- ▶ Pull out the push-in bolt, and pivot the two securing hooks out of the way.
- ▶ Place the System ladder XS 4.40m onto the Connector XS, with the hooking brackets facing downwards.
- ▶ Close the securing hooks.
- ▶ Insert the push-in bolt into whichever rung of the ladder is suitable for the height of the formwork, and secure it with a linch pin.



- D** Securing barrier XS

The components needed for mounting the Securing barrier XS are captively attached to it.



- in the front position (a)

- A** Push-in bolt
- B** Securing hooks
- C** System ladder XS 4.40m

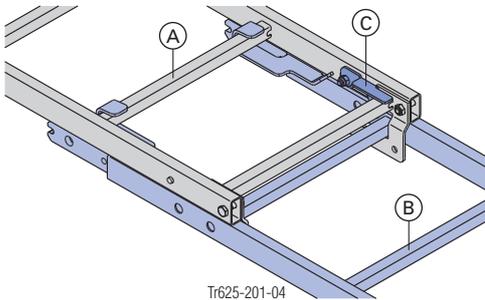
#### to the bottom Connector XS Wall formwork

- ▶ Pull out the push-in bolt, pivot both securing hooks out of the way, and place the ladder onto the Connector XS.

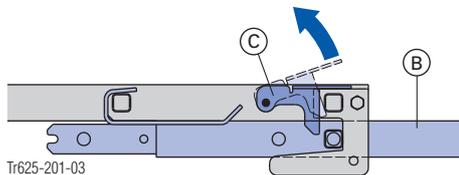
## Ladder system XS for heights above 3.75 m

### Telescoping ladder extension (for adjusting to ground level)

- ▶ To telescope the ladders past one another, lift the safety latch on the ladder and fix the Ladder extension XS 2.30m onto the desired rung of the other ladder.



### Close-up

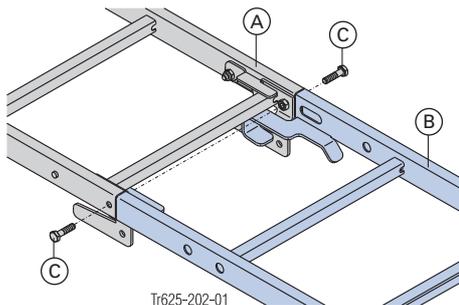


- A** System ladder XS 4.40m
- B** Ladder extension XS 2.30m
- C** Safety latch

A telescoping joint between two Ladder extensions XS 2.30m can be made in the same way.

### Permanently fixed ladder extension

- ▶ Insert the Ladder extension XS 2.30m into the uprights of the System ladder XS 4.40m, with its hooking brackets facing downwards, and fasten it. Tighten the screws only **slightly!**



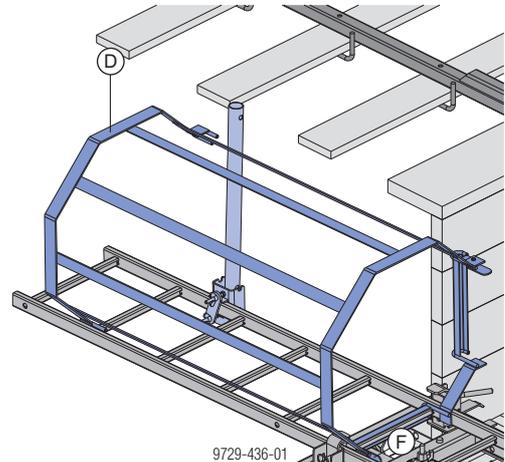
Bolts (C) are included in the scope of supply of the System ladder XS 4.40m and the Ladder extension XS 2.30m.

- A** System ladder XS 4.40m
- B** Ladder extension XS 2.30m
- C** Bolts, width-across 17 mm

Two Ladder extensions XS 2.30m can be fixed together in the same way.

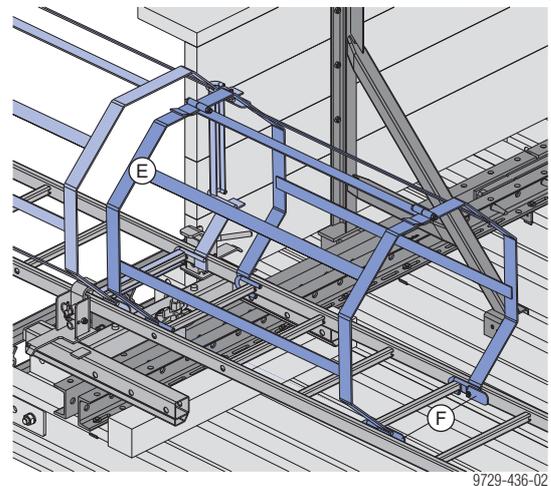
### ! NOTICE

- ▶ Always observe all relevant safety regulations applying to the use of the ladder cage in the country in which you are operating (e.g. in Germany: BGV D 36).
- ▶ Attach the Ladder cage exit XS (the bottom of the cage must always be at the same height as the platform). The safety latches prevent the cage from being accidentally lifted out.



- D** Ladder cage exit XS
- F** Safety latch (anti-liftout guard)

- ▶ Attach further ladder cages, in each case to the next available rung.



- E** Ladder cage XS
- F** Safety latches (anti-liftout guard)

## Items needed

Connectors + ladder	Formwork height		
	2.70-3.25 m	>3.25-6.00 m	>6.00-8.25 m
Connector XS wall formwork	2	2	3
System ladder XS 4.40m	1	1	1
Ladder extension XS 2.30m	0	1	2
Tie rod 15.0 galvanised ..... m (length = 0.40 m)	2	2	3
Super plate 15.0	4	4	6
Squared timber 10x10 cm	1	1	1

Ladder cage	Formwork height					
	2.70-3.15 m	>3.15-4.05 m	>4.05-5.40 m	>5.40-6.60 m	>6.60-7.65 m	>7.65-8.25 m
Ladder cage exit XS <sup>1)</sup>	1	1	1	1	1	1
Securing barrier XS <sup>1)</sup>	1	1	1	1	1	1
Ladder cage XS 1.00m <sup>1)</sup>	0	1	2	3	4	5

<sup>1)</sup> This does not take account of any intermediate exits.

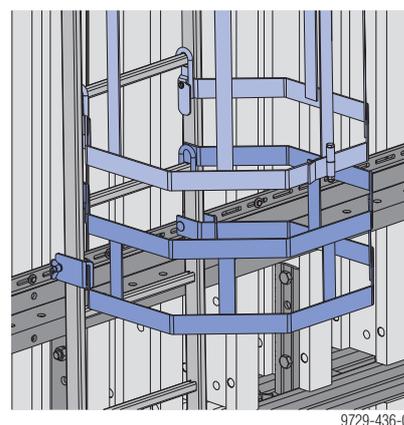
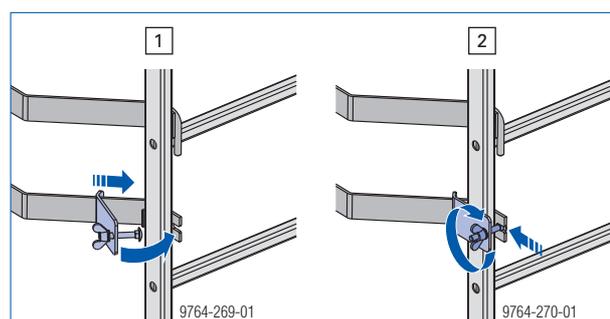
## Exit onto an intermediate platform

### Basic rule:

- The number of Connectors XS wall formwork and ladder components is shown in the 'Items needed table.
- For each additional exit, one Ladder cage exit XS and one Securing barrier XS are required.
- Any over-large openings above the intermediate exit must be reduced with a Ladder cage XS 0.25m.

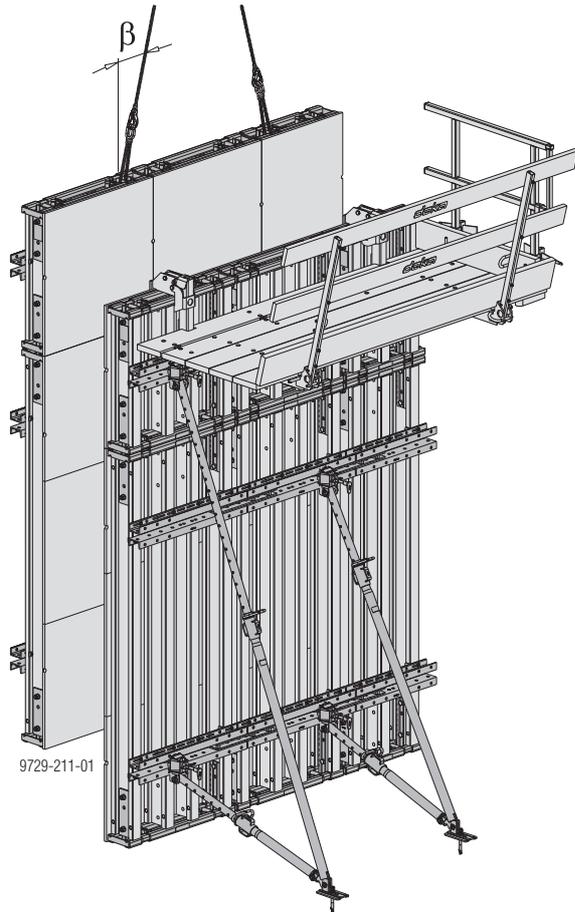
### Mounting the Ladder cage XS 0.25m

- ▶ Hook the ladder cage into an empty rung and secure it against accidental lift-out.



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# Lifting by crane

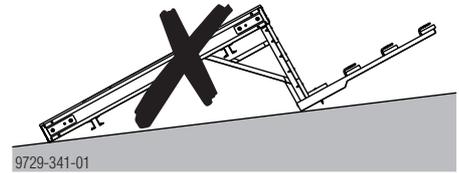


The crane lifting points are integrated into the stacking flanges of the elements. Consequently, there are no protruding parts to obstruct pouring.



## NOTICE

- Spread angle  $\beta$  of slinging chains: max. 30°.
- Brace the formwork in a windproof manner when erecting it or when it is temporarily placed in the standing position.
- **Do not set down the gang-form on the platform.**

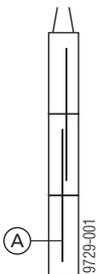
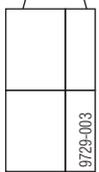


However, for your own safety, please observe the following points:

- Only set down the elements, or stack of elements, on flat surfaces that are capable of supporting the load.
- Do not detach an element from the crane until it has been safely set down.
- Never climb onto the stack of elements.

### Permissible total weight of each unit for repositioning:

- Attachment to a panel 2.00 m wide: 2000 kg
- Attachment to a narrower panel: 1500 kg

Permissible total weights			
1500 kg		2000 kg	
			

(A) Multi-purpose waling WS10 Top50

## Crane slinging

FF20 gang-forms are attached to the crane with the **Lifting chain 100cm/15kN**.



Follow the Operating Instructions!

### Attaching the elements



▶ Direct attachment of the crane suspension tackle to the round pins or stirrups is not permitted.

#### Examples for correct attachment

to the formwork element	to the stacking element	to the stacking element (new type with ring)
Attachment of the crane suspension tackle only with with Lifting chain 100cm/15kN		Direct attachment of the crane suspension tackle to new type of element with movable ring is permitted.

### Stripping and repositioning the panels

**Before repositioning:** Remove any loose items from the formwork and platforms, or secure them firmly.



#### NOTICE

▶ Make sure the tag-lines are long enough to enable the holders to stay outside the danger zone at all times.



#### WARNING

The formwork tends to adhere to the concrete. When stripping the formwork, do not try to break concrete cohesion using the crane!

Risk of injury and damage to property due to crane overload.

▶ Use suitable tools such as timber wedges or a special pry-bar to detach the formwork from the concrete.

▶ Crane-lift the gang-form to its next location (guide with tag-lines if necessary).

## Transporting, stacking and storing

Formwork elements FF20 from Doka are delivered pre-assembled to your jobsite and are ready for use right away.

There is only a small number of element sizes, so the layout is clear, commissioning quantities are smaller, and storage and transport are easier.

Formwork elements FF20 take up little yard or transport space.



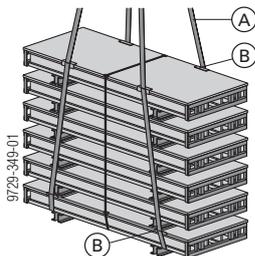
### NOTICE

- The elements must be unloaded and off-loaded, transported and stacked in such a way that it is not possible for them to fall off, tip over or slide apart.
- The elements have to be bundled for transport by truck and edge-protection corners or extra wooden battens have to be used to protect the formwork sheet from damage.

## Transporting the panels

The Dokamatic lifting strap 13.00m is a practical tool for **unloading and loading trucks**, and for **lifting and setting down single elements and complete stacks of elements**.

Edge-protection corners are used to protect the formwork sheet from damage.



A Dokamatic lifting strap 13.00m

B Edge-protection corners



### WARNING

- ▶ The Lifting straps 13.00 m may only be used as shown if there is no risk of the straps sliding towards one another, or of the load being displaced.

Max. load-bearing capacity: 2000 kg



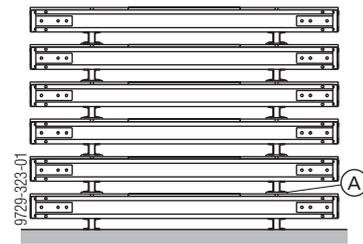
Follow the Operating Instructions!

## Bundling the panels

### Element heights 2.75, 3.75 and 6.50 m

- ▶ Always lay the bottom element flat with the multi-purpose walings down.
- ▶ Then stack the rest of the elements flat one on top of the other, always with the multi-purpose walings down. Use strips of formwork sheeting as spacers underneath the multi-purpose walings (protection).

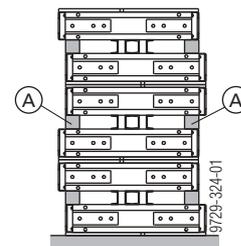
- ▶ **Stack elements no more than six high** - stacking height approx. 2 m.



A Strip of formwork sheeting

### Element height 1.00 m

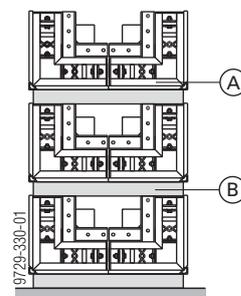
- ▶ Place squared timbers 10/10 cm or a pallet in position.
- ▶ Lay the bottom element flat with the multi-purpose walings up.
- ▶ Stack the rest of the elements on top, in turn waling beside waling and formwork sheet to formwork sheet. Insert squared timbers 10/10 cm at each end at each waling-beside-waling layer in the stack!
- ▶ **Stack elements no more than six high** - stacking height approx. 2 m.



A Squared timber 10/10 cm

### Inside corners FF20

- ▶ Place squared timbers 10/10 cm at both ends.
- ▶ Lay 2 inside corners facing each other.
- ▶ On top of every layer of 2 corners, place a squared timber directly on the corner waling.
- ▶ **Stack elements no more than three high** - stacking height approx. 2 m.



A Inside corner FF20

B Squared timber 10/10cm

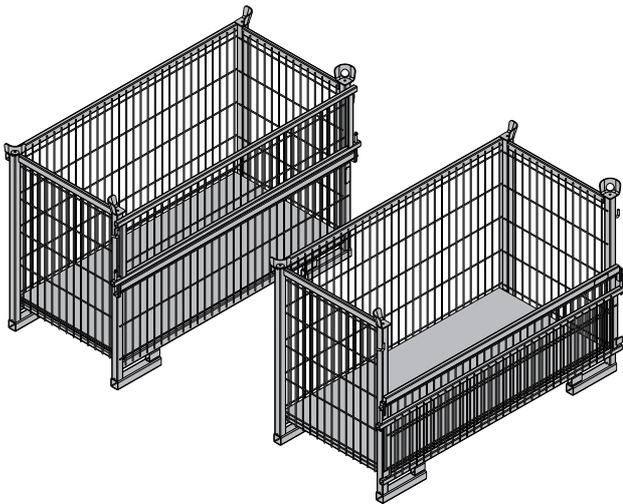
## Doka multi-trip packaging

### Utilise the benefits of Doka multi-trip packaging on your site.

Multi-trip packaging such as containers, stacking pallets and skeleton transport boxes keep everything in place on the site, minimise time wasted searching for parts, and streamline the storage and transport of system components, small items and accessories.

## Doka skeleton transport box 1.70x0.80m

Storage and transport device for small items



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

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

## 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 gradients up to 3%	Indoors Floor gradients 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.

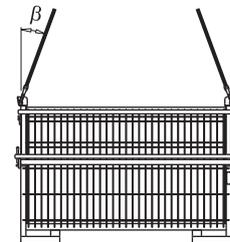
## Using Doka skeleton transport boxes 1.70x0.80m as transport devices

### 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 crane suspension tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread angle  $\beta$  max. 30°!



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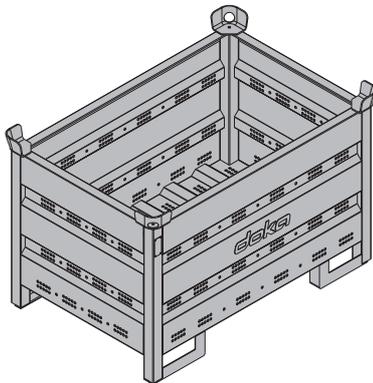
### Repositioning by forklift truck or pallet stacking truck

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

## Doka multi-trip transport box

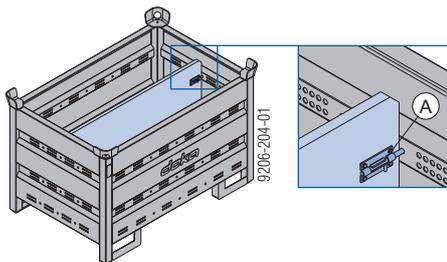
Storage and transport device for small items

### Doka multi-trip transport box 1.20x0.80m



Max. carrying capacity: 1500 kg (3300 lbs)  
Permitted imposed 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

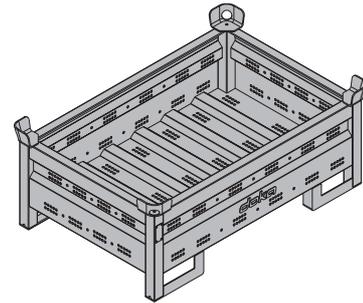
Multi-trip transport box partition	in the longitudinal direction	in the transverse direction
1.20m	max. 3 partitions	-
0.80m	-	max. 3 partitions

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9206-204-03

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



Max. carrying capacity: 750 kg (1650 lbs)  
Permitted imposed 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)		Indoors	
Floor gradients up to 3%		Floor gradients up to 1%	
Doka multi-trip transport box 1.20x0.80m	Doka multi-trip transport box 1.20x0.80x0.41m	Doka multi-trip transport box 1.20x0.80m	Doka multi-trip transport box 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.

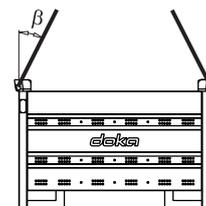
### Using Doka multi-trip transport boxes as transport devices

#### Lifting by crane



#### NOTICE

- Multi-trip packaging items must be lifted individually.
- Use a suitable crane lifting tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread angle  $\beta$  max. 30°!



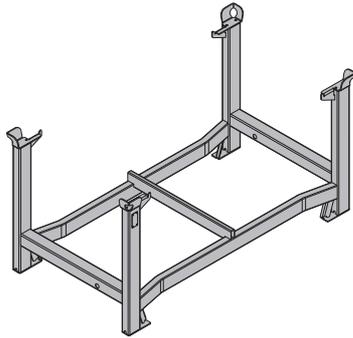
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#### Repositioning by forklift truck or pallet stacking truck

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.



Max. carrying capacity: 1100 kg (2420 lbs)  
Permitted imposed load: 5900 kg (12980 lbs)

### Using Doka stacking pallets as storage units

#### Max. n° of units on top of one another

Outdoors (on the site) Floor gradients up to 3%	Indoors Floor gradients up to 1%
2	6
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.
- **How to use with Bolt-on castor 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 castor set mounted to it.

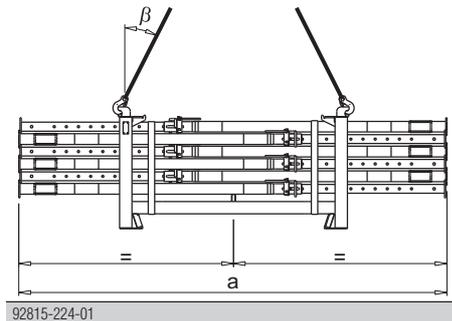
## Using Doka stacking pallets as transport devices

### Lifting by crane



#### NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable crane suspension tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Load the items centrally.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.
- Spread angle  $\beta$  max. 30°!



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

### Repositioning by forklift truck or pallet stacking truck

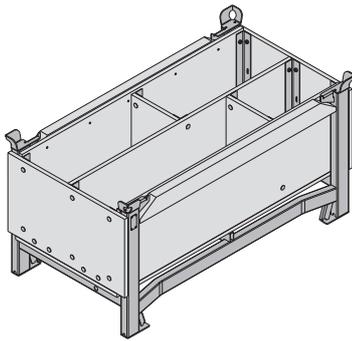


#### NOTICE

- Load the items centrally.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.

## Doka accessory box

Storage and transport device for small items



Max. carrying capacity: 1000 kg (2200 lbs)  
Permitted imposed load: 5530 kg (12191 lbs)

### Doka accessory boxes as storage units

#### Max. n° of units on top of one another

Outdoors (on the site) Floor gradients up to 3%	Indoors Floor gradients up to 1%
3	6
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.
- **How to use with Bolt-on castor 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 castor set mounted to it.

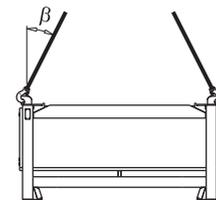
## Doka accessory box as transport devices

### Lifting by crane



#### NOTICE

- Multi-trip packaging items must be lifted individually.
- Use a suitable crane lifting tackle (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread angle  $\beta$  max. 30°!



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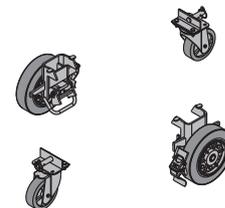
### Repositioning by forklift truck or pallet stacking truck

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

## Bolt-on castor set B

The Bolt-on castor set B turns the stacking pallet into a fast and manoeuvrable transport device.

Suitable for drive-through access openings > 90 cm.



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

- Doka accessory box
- Doka stacking pallets
- Protective barrier Z pallet



Follow the directions in the 'Bolt-on castor set B' Operating Instructions!

# Wall formwork with Platform system Xsafe plus

## Platform system Xsafe plus

These pre-assembled, fold-out working platforms with their installable side railings, self-closing man-hole lids and integrable ladders are ready for immediate use and greatly improve workplace safety.

### Easy to use

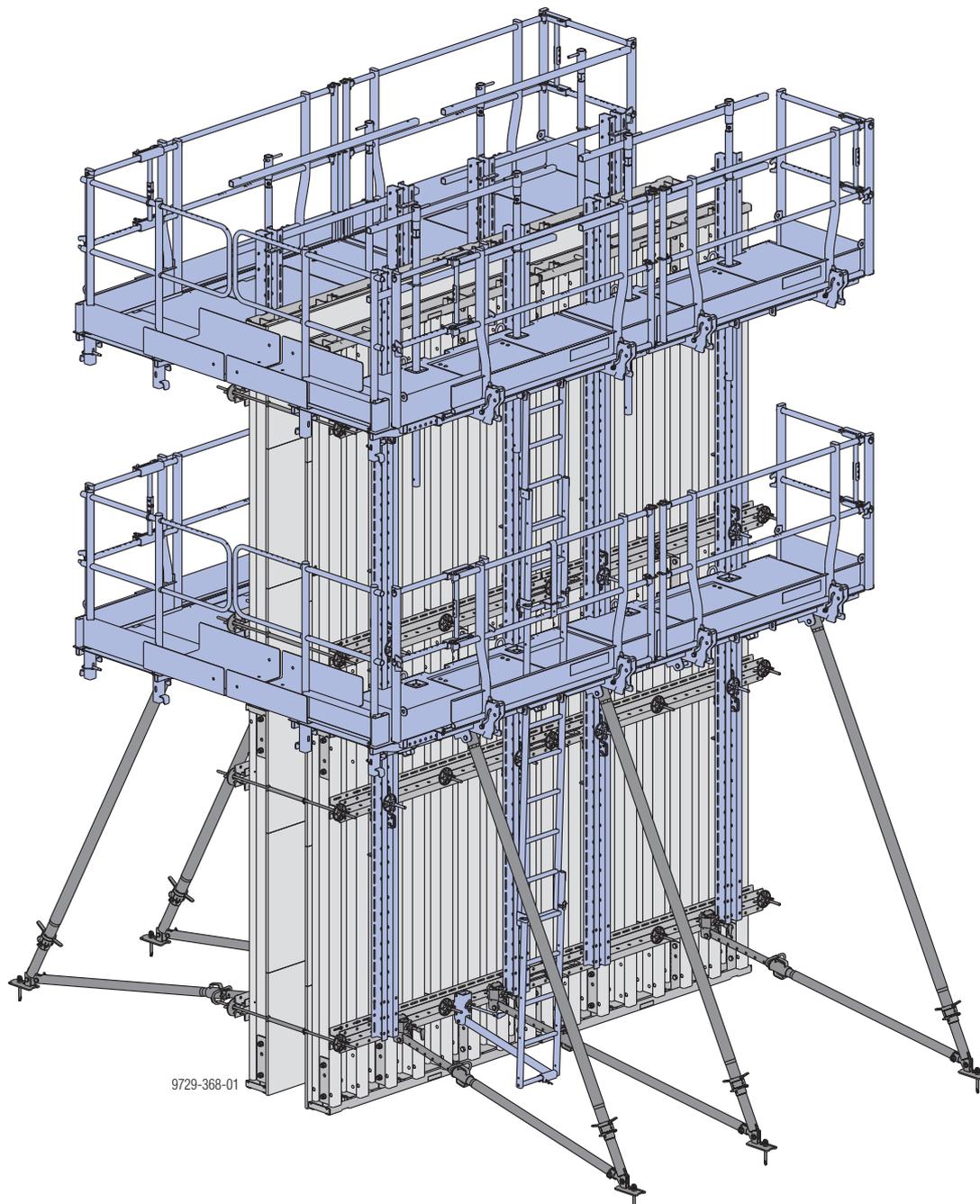
- pre-assembled, fold-out working platforms
- time and cost-savings as so little assembly work is needed
- system accessories for closure gaps and corner transitions

### Safe working

- high level of safety with back railings and end railings.
- integrable ladder system

### An economical solution

- its perfect stackability cuts storage and freight costs
- simplified planning, from using a single platform concept for all Doka wall systems
- much quicker and more efficient than single brackets



## Instructions for assembly and use (Method statement)

### Planning guidelines

**Permissible total weight** of the gang-form unit (formwork incl. platforms, panel struts etc.) to be lifted:

- Gang-form widths  $\geq 2.0$  m: **2400 kg**
- Gang-form widths  $< 2.0$  m: **1250 kg**

Co-ordinate the widths of the gang-forms with the lengths of the Xsafe plus platforms.

We recommend forming corners and similar snags in the following way:

#### ▪ Variant 1

Divide up the work into separate pouring sections (i.e. separated by a construction joint):

- Set up formwork and pour first straight wall.
- Set up formwork and pour second straight wall, with corner connection.

#### ▪ Variante 2

Cast in a single pour (no construction joint):

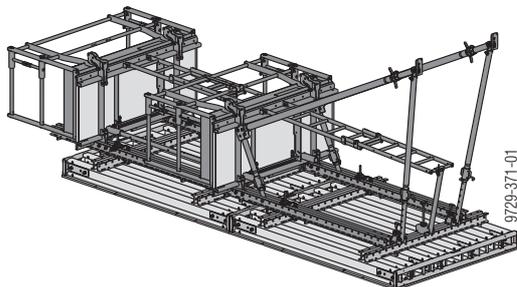
- First set up the formwork for the corners.
- Then set up the formwork for the straight wall between the corners.
- Cast in one single pour.

The sequence outlined below is based on a straight wall.

Ladders must be located so as to create viable 'traffic routes' in the horizontal. (On a straight wall, for example, one ladder on the first element and another on the last).

### Pre-assembly

- ▶ Pre-assemble elements face-down on an assembly bench (see 'Inter-panel connections').
- ▶ Mount the vertical multi-purpose walings, platforms, ladders and panel struts to the face-down gang (see the relevant sections of this manual).



### Closing the formwork

- ▶ Attach the lifting chain to the vertical multipurpose walings (see the Xsafe plus section headed 'Resetting by crane').
- ▶ Pick up the gang-form by crane.
- ▶ Spray the formwork sheet with release agent (see 'Cleaning and care').
- ▶ Fly the gang-form to its new location.

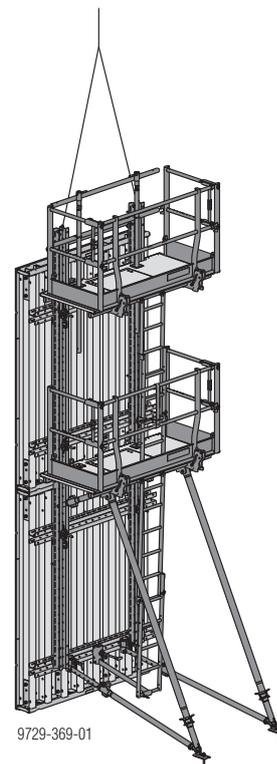


#### CAUTION

Never use a sledge-hammer to plumb and align the elements!

This would damage the elements.

- ▶ Use only proper plumbing tools (e.g. a special pry-bar) that cannot cause any damage.
- ▶ Fix the panel struts firmly to the ground (see 'Plumbing accessories').  
The gang-form is now stable and can be plumbed and aligned exactly, with no need for the crane.
- ▶ Extend the Xsafe plus counter railing (see the section headed 'Xsafe plus platform accessories').



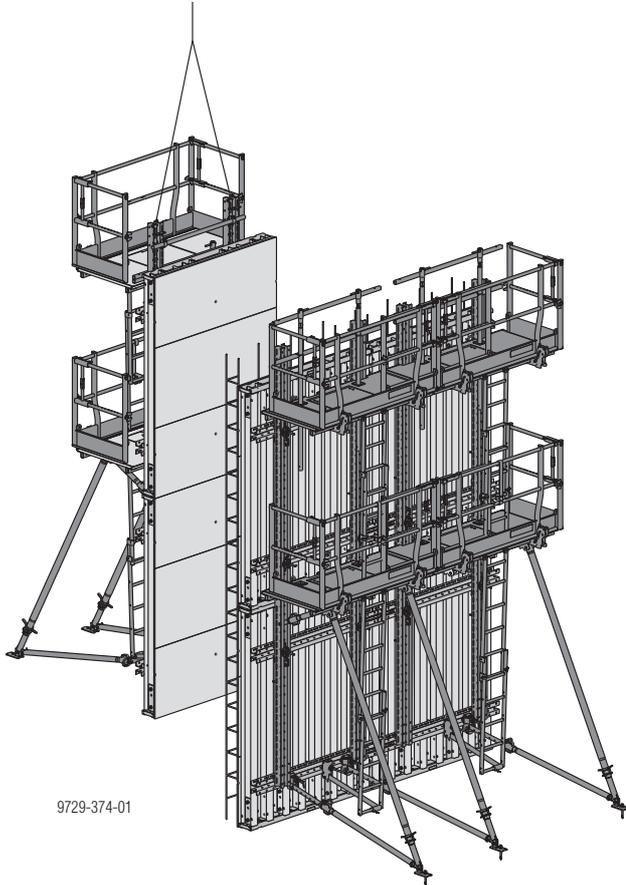
The platform railings are now **in place on all sides**, making it safe to get up onto the platform.

- ▶ Detach the gang-form from the crane.
- ▶ Continue lining up further gang-forms in this way, and link them together (see 'Inter-panel connections').

## Erecting the opposing formwork:

Once the reinforcement has been placed, the formwork can be closed.

- ▶ Spray the formwork sheet with release agent (see the section headed 'Cleaning and care of your equipment').
- ▶ Lift the opposing formwork by crane to its next location.



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- ▶ Working from the ground, insert the bottom rows of form ties (see the section headed 'Tie rod system').



Before disconnecting from the crane:

- ▶ If there are no panel struts on the opposing formwork, do not disconnect the element from the crane until a large enough number of form ties have been installed to keep it safely in the upright.
- ▶ Fix the panel struts firmly to the ground (see the section headed 'Plumbing accessories').
- ▶ Detach the gang-form from the crane.
- ▶ Insert the remaining form ties. These form-tie locations can be reached from the platforms.
- ▶ Continue lining up further gang-forms in this way, and link them together (see the section headed 'Inter-panel connections').

## Pouring

**Permitted fresh-concrete pressure: 50 kN/m<sup>2</sup>**

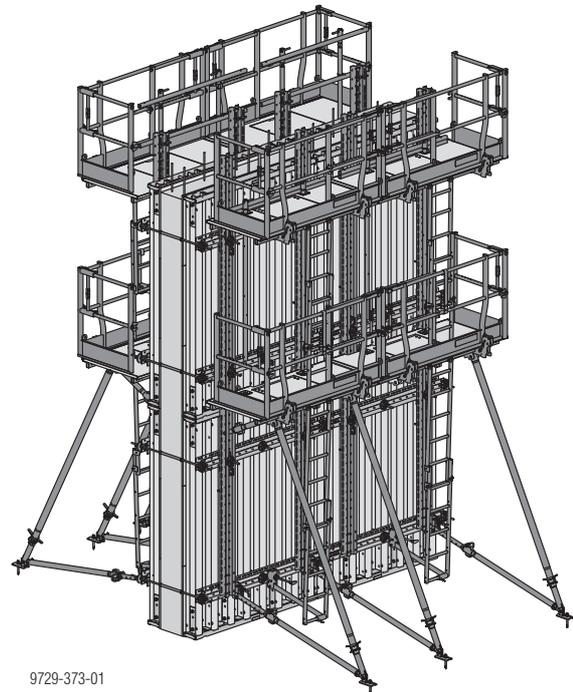
Observe the following **guidelines**:

- The section headed 'Pressure of fresh concrete on vertical formwork – DIN 18218' in the Calculation Guide 'Doka formwork engineering'
- DIN 4235 Part 2 - 'Compacting of concrete by vibrating'



### NOTICE

- ▶ Do not exceed the maximum permissible rate of placing.
- ▶ Lower the Xsafe plus counter railing.
- ▶ Pour the concrete.
- ▶ Make only moderate use of vibrators, carefully coordinating the times and locations of vibrator use.



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## Stripping the formwork



### NOTICE

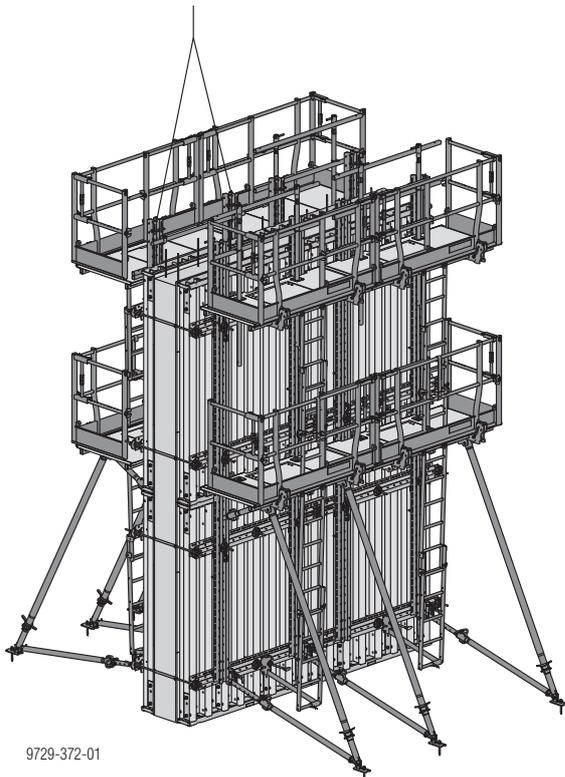
- ▶ Comply with the stipulated stripping times.
- ▶ Remove any loose items from the formwork and platforms, or secure them firmly.

### Begin work on stripping the formwork on the opposing formwork:



Where the opposing formwork has no panel struts:

- ▶ When removing form ties, leave enough form-ties in place to safely keep the elements in the upright.
- ▶ Attach the gang-form of the opposing formwork to the crane.
- ▶ Remove the remaining form ties.
- ▶ Take out the form ties and undo the connectors to the adjacent elements.
- ▶ Attach the crane lifting tackle to the vertical multi-purpose walings (see the Xsafe plus section headed 'Lifting by crane').
- ▶ Undo the ground anchors of the panel struts.



### WARNING

The formwork tends to adhere to the concrete. When stripping the formwork, do not try to break concrete cohesion using the crane! Risk of crane overload.

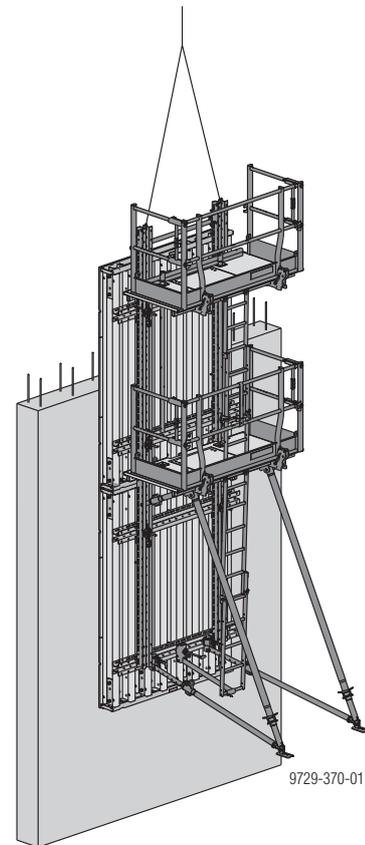
- ▶ Use suitable tools such as timber wedges or a special pry-bar to detach the formwork from the concrete.
- ▶ Lift the gang-form away and to its next location, or place it flat on its back for intermediate storage. If the gang-form is 'parked' in the upright prior to its next use, it must have sufficient stability (see the

Xsafe plus section headed 'Plumbing accessories'). Gang-forms with only one panel strut must not be 'parked' upright, but placed face-down.

- ▶ Clean residual concrete off the formwork sheet (see the section headed 'Cleaning and care of your equipment').

### Stripping the holding formwork:

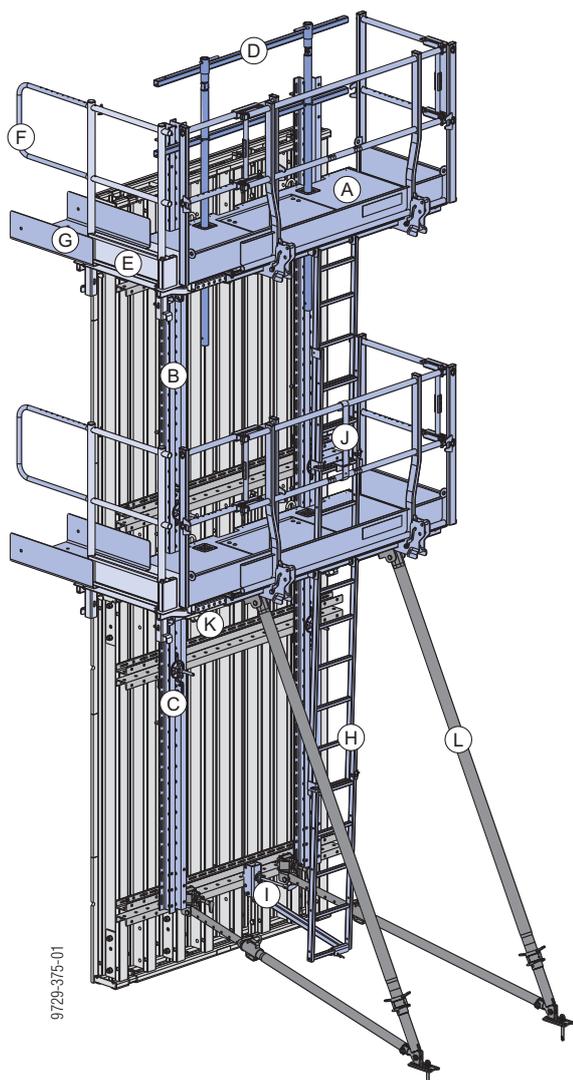
- ▶ Undo the connectors to the adjacent elements.
- ▶ Extend the Xsafe plus counter railing (see the section headed 'Xsafe plus platform accessories').
- ▶ Attach the crane lifting tackle to the vertical multi-purpose walings (see the Xsafe plus section headed 'Lifting by crane').
- ▶ Lower the Xsafe plus counter railing.
- ▶ Undo the ground anchors of the panel struts.
- ▶ Lift the gang-form away and to its next location, or place it flat on its back for intermediate storage.



If the gang-form is 'parked' in the upright prior to its next use, it must have sufficient stability (see the Xsafe plus section headed 'Plumbing accessories'). Gang-forms with only one panel strut must not be 'parked' upright, but placed face-down.

- ▶ Clean residual concrete off the formwork sheet (see the section headed 'Cleaning and care of your equipment').

## Platform system

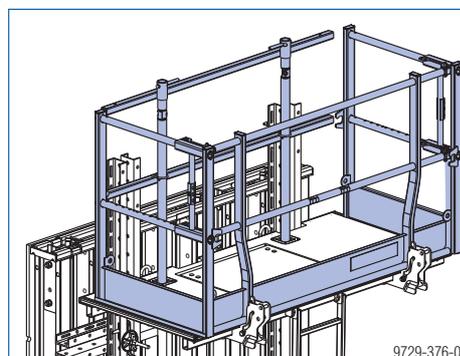


- A Xsafe plus platform
- B Multipurpose waling
- C Xsafe plus waling connector
- D Xsafe plus counter railing
- E Xsafe plus platform extension 0.60m
- F Xsafe plus handrail extension
- G Xsafe plus platform transition
- H Xsafe plus telescopic ladder
- I Xsafe plus ladder starter piece
- J Xsafe plus ladder support
- K Xsafe plus supporting strut EB
- L Panel strut

### Immediately work-ready platform

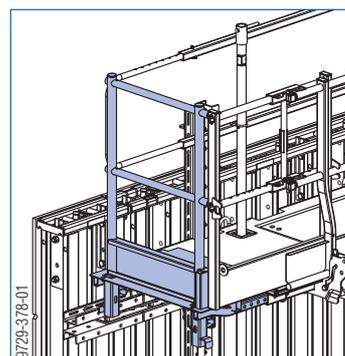
- quick and easy to assemble

### Guard rails on all four sides



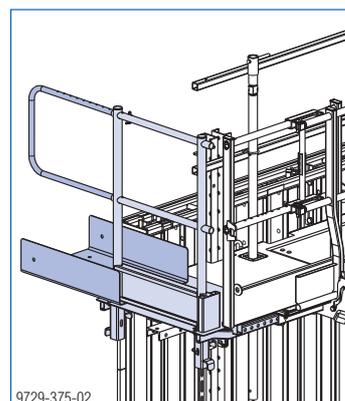
- enables work to take place in complete safety

### Platform extension



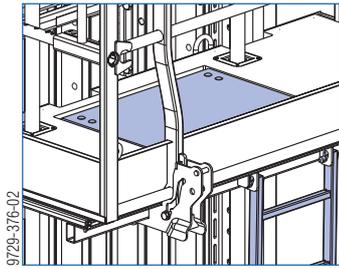
- permits flexible adaptation to formwork, with no need for improvisations

### Safe solutions for corner transitions as well



## Integral ladder and manhole

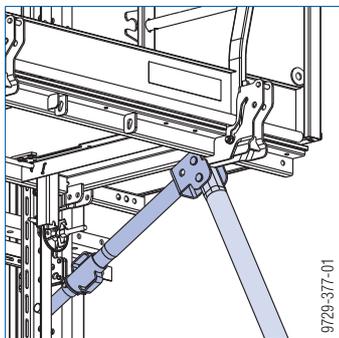
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- for safe vertical access up to the platform
- self-closing manhole lid (self-closing function can be deactivated)
- spring-assisted opening of manhole lid

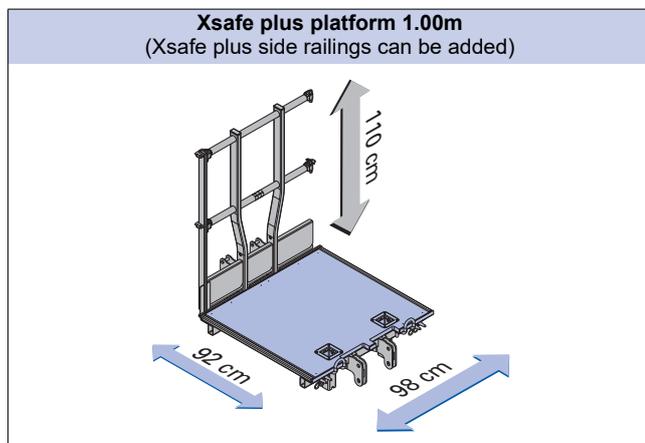
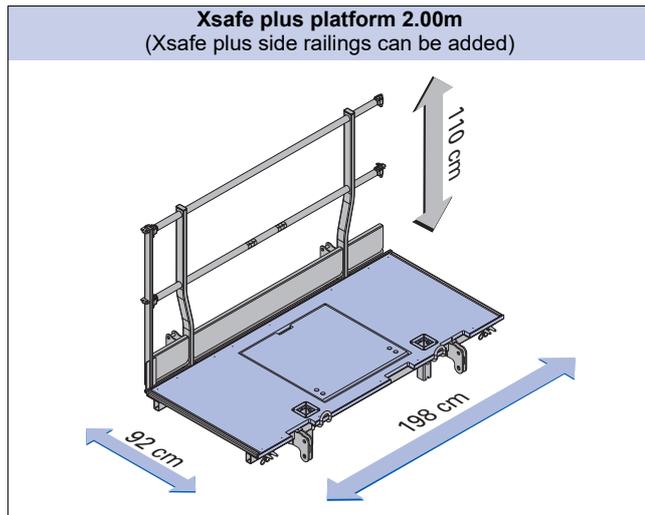
## Panel struts connected to rear of platform

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- leaves unobstructed workplace access routes and simplifies the planning
- the Xsafe plus supporting strut makes it possible to adjust the inclination of the platform

## Xsafe plus platform

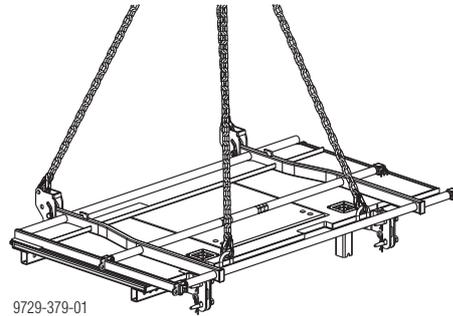


**Permitted service load: 1.5 kN/m<sup>2</sup> (150 kg/m<sup>2</sup>)**  
Load Class 2 to EN 12811-1:2003

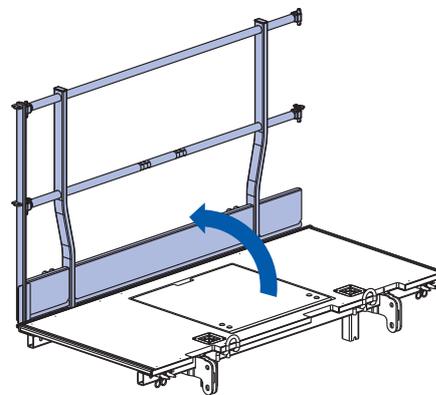
**Note:**  
For information on other available Xsafe plus platforms (2.70m, 2.40m and 1.35m), please refer to the 'Large-area formwork Top 50' and 'Framed formwork Framax Xlife' User Information booklets.

### Preparing the platform

- ▶ Lift the Xsafe plus platform off the stack by crane, using a four-part lifting chain (e.g. Doka 4-part chain 3.20m), and set it down on the ground.



- ▶ Tilt up the rear railings.

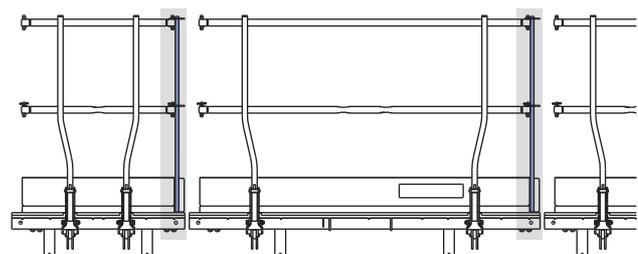


They lock into place automatically.

### Railing-closure post on platforms without side railings



The railing-closure post **reduces the gap between two rear railings.**



Where necessary, the railing-closure post can also be mounted to the other end of the rear railings.

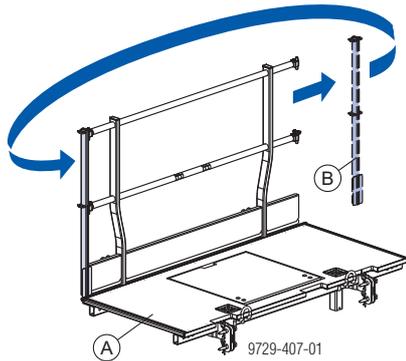
## Mounting end-of-platform sideguards

Xsafe plus platforms without integral side railings can be retrofitted with a side railing (e.g. for safety barriers at the end of a wall).

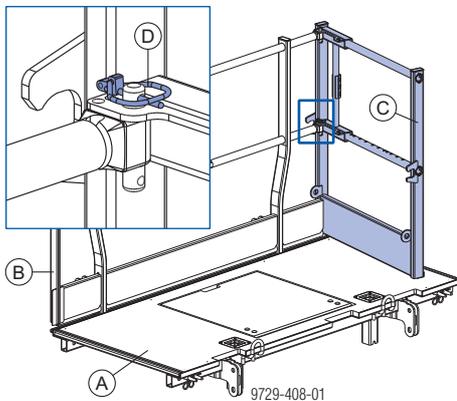
**Note:**

The symmetrical design of the Xsafe plus side railing means that it can be mounted to either side of the platform.

- 1) If necessary, dismantle the Xsafe plus railing-closure post from the Xsafe plus platform and re-mount it at the other end of the rear railings (stand-by position).



- 2) Hook the Xsafe plus side railing into the rear railing and secure it with a linch pin. When doing this, swivel the side railing inwards slightly (by approx. 5°). This makes it easier to hook the side railing into the rear railing.

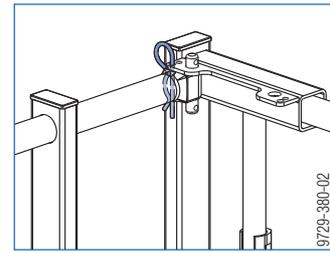


- A Xsafe plus platform
- B Xsafe plus railing-closure post
- C Xsafe plus side railing
- D Linch pin of Xsafe plus platform



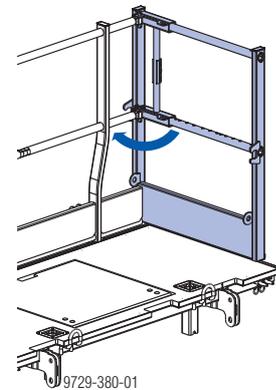
The side railings are secured so that they cannot open outwards (i.e. by more than 90°).

The side railing can be fixed in this position with a Spring cotter 5mm.



## Swivelling the end-of-platform sideguard inward

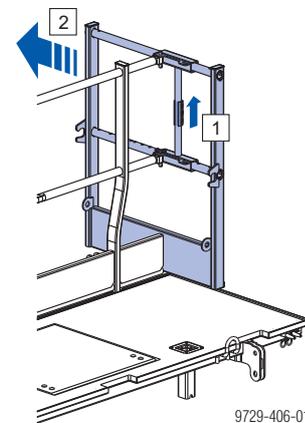
The sideguards can be swung 90° inward when necessary (e.g. to extend the back railing or create an access opening).



## Moving the end-of-platform sideguards backwards

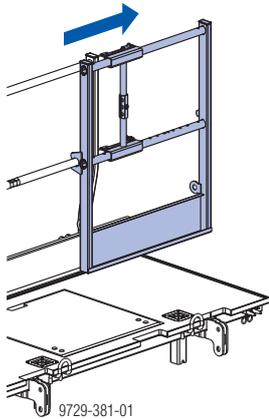
The sideguards can be moved backwards if needed (e.g. at corner transitions or to create an access opening).

- 1) Slide the telescope-lock upwards.
- 2) Push the side railings backwards.



## Extending the rear railings

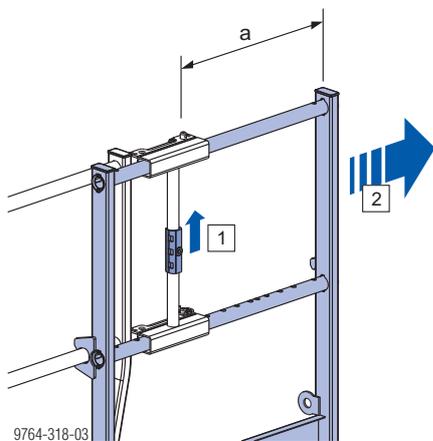
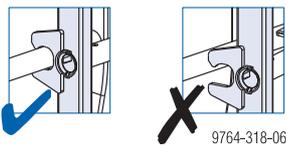
The end-of-platform sideguards can also be used to extend the rear railings (e.g. if the platform has been lengthened to either side).



- 1) Slide the telescope-lock upwards.
- 2) Extend the side railings to the desired length.



The railing tube must be firmly enclosed by the tube-guide.



a ... can be telescoped by up to 50 cm, in a 5 cm grid

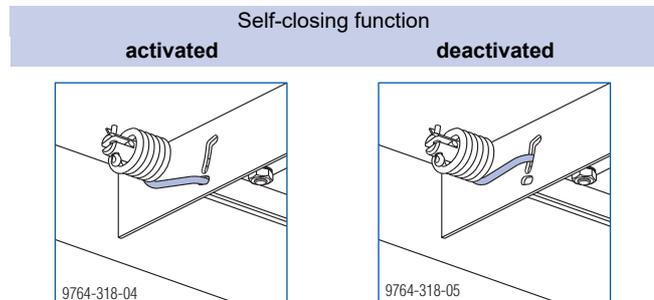
## Manhole lid

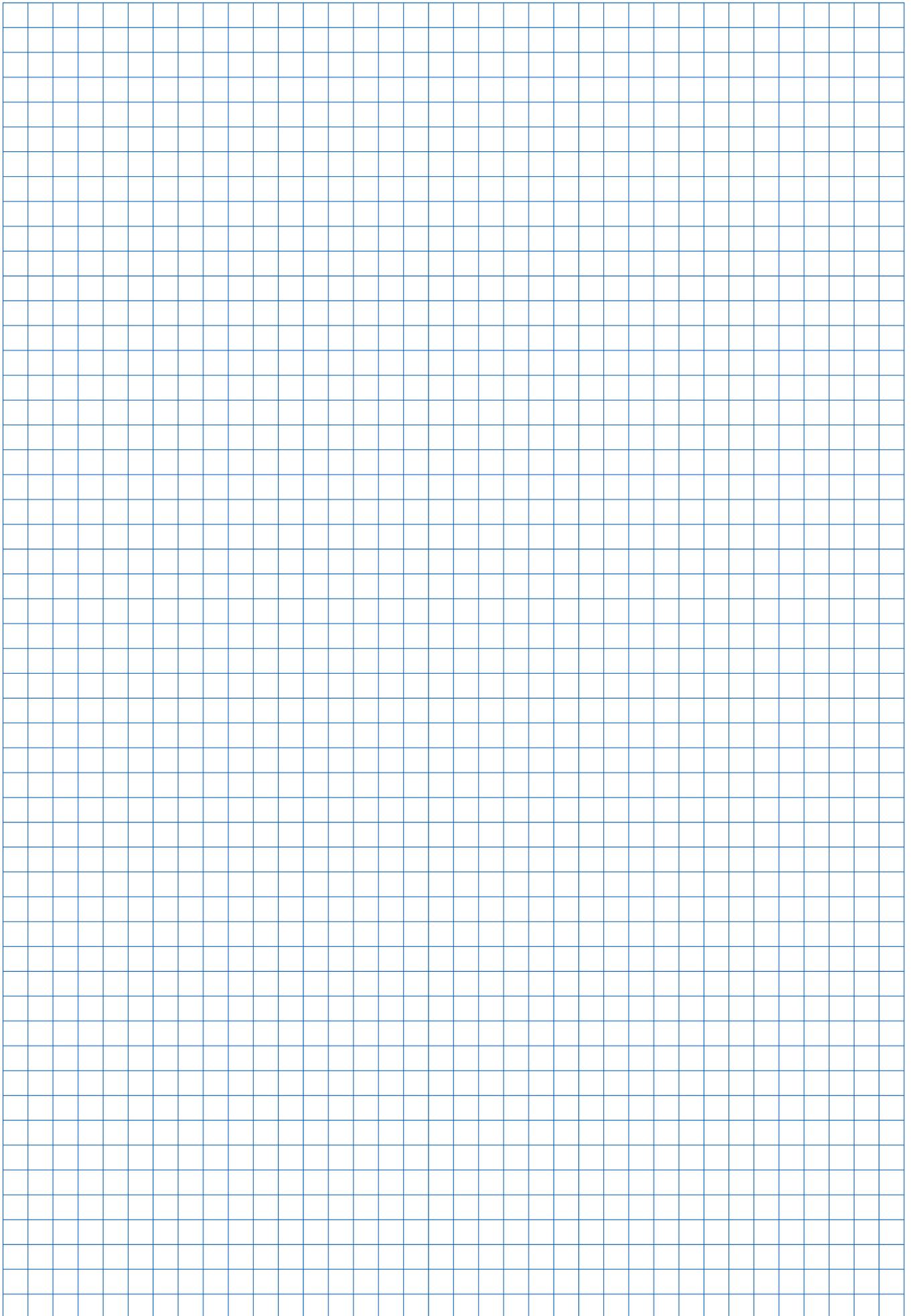
The spring integrated in the manhole has 2 functions:

- to make the lid easier to open
- to make the lid close automatically

Where local regulations permit, the self-closing function of the manhole lid can be deactivated.

- ▶ Use a flat-bladed screwdriver to change the position of the spring.



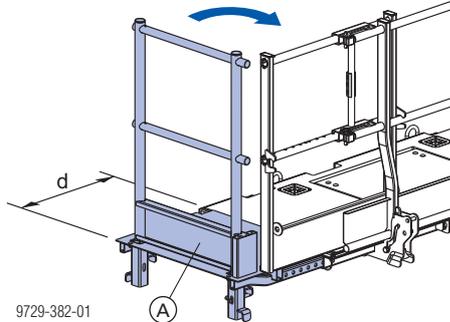


## Xsafe plus platform accessories

### Extending the platform to either side

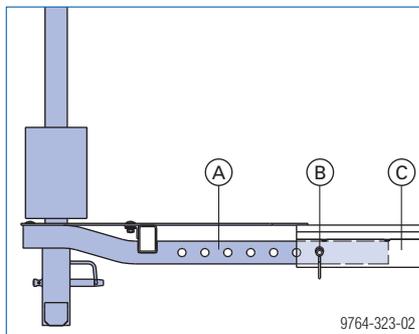
The platform can be lengthened at either end by using the **Xsafe plus platform extension 0.60m**.

The railings of the platform extension can be turned inwards by 90°.



d ... can be telescoped between 30 cm and 60 cm, in a 5 cm grid

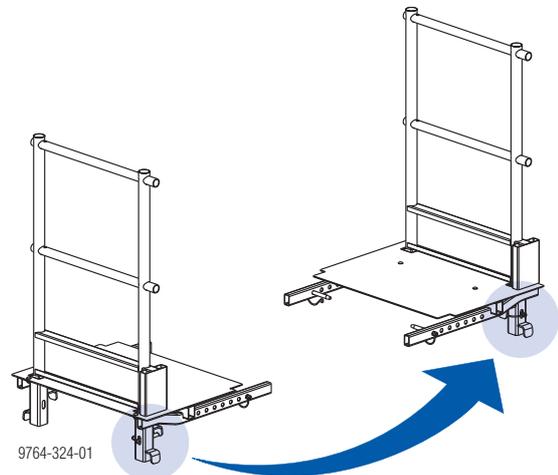
#### How to attach the platform extension:



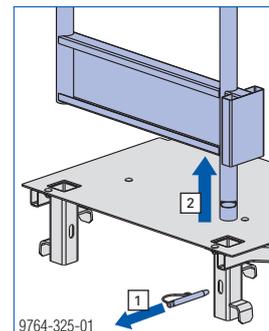
- A** Xsafe plus platform extension 0.60m
- B** Spring-locked connecting pin of Xsafe plus platform extension 0.60m
- C** Xsafe plus platform

### Adapting the platform extension for use on left or right

The railings of the platform extension will need to be modified, depending on whether the platform extension is to be mounted to the right-hand or left-hand side of the platform.



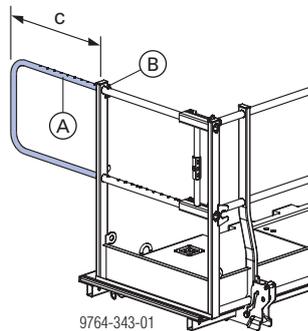
- 1) Take out the spring-locked connecting pin.
- 2) Pull out the railing.



The railing can now be mounted on the other side, in reverse order.

## Extending the end-of-platform sideguards

The end-of-platform sideguards on the platform can be lengthened using the **Xsafe plus handrail lengthening piece**.



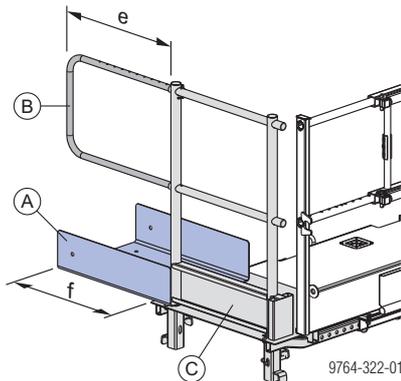
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c ... can be telescoped between 15 cm and 70 cm, in a 5 cm grid

- A Xsafe plus handrail lengthening piece
- B Linch pin of Xsafe plus handrail lengthening piece

## Platform transition

Together with an **Xsafe plus handrail lengthening piece**, the **Xsafe plus platform transition** provides a safe crossing point to the opposite platform.



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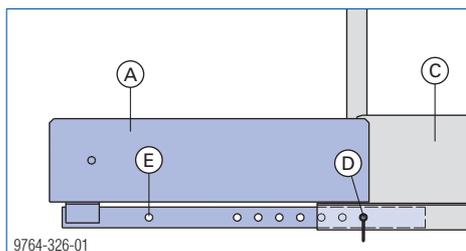
e ... can be telescoped between 15 cm and 70 cm, in a 5 cm grid

f ... can be telescoped between 33.5 cm and 63.5 cm, in a 5 cm grid

Wall thickness	Xsafe plus platform transition	Xsafe plus handrail extension
Up to 45 cm	2 units <sup>1)</sup>	2 units <sup>1)</sup>

<sup>1)</sup> Mount one platform transition on the holding formwork, and one on the opposing formwork (see also the section headed 'Stop-end formwork').

### Attaching the platform transition:



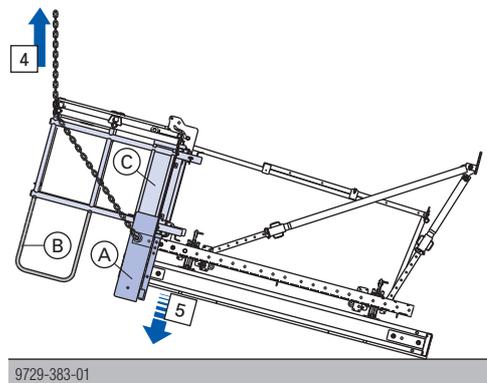
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- A Xsafe plus platform transition
- B Xsafe plus handrail lengthening piece
- C Xsafe plus platform extension 0.60m

- D Spring-locked connecting pin of the Xsafe plus platform transition
- E Bolting hole for mounting to a panel placed on its side

### How to mount:

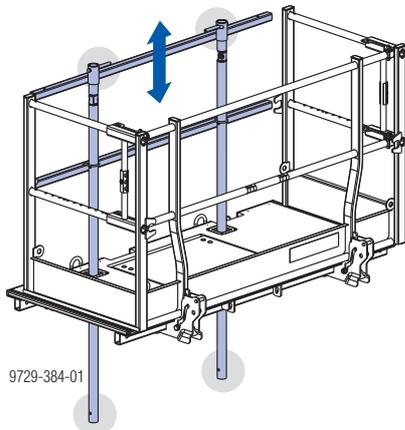
- 1) Slightly raise the railing of the Xsafe plus platform extension (C) .
- 2) Slide the Xsafe plus platform transition (A) all the way into the Xsafe plus platform extension (C) and fix it in the bolting hole (E) with the spring-locked connecting pin.
- 3) Slide the Xsafe plus platform extension (C) into the Xsafe plus platform and fix it with a spring-locked connecting pin.
- 4) Raise the gang-form by crane.
- 5) Extend the Xsafe plus platform transition (A) to the desired length and fix it with a spring-locked connecting pin.
- 6) Mount the Xsafe plus handrail lengthening piece (B) .



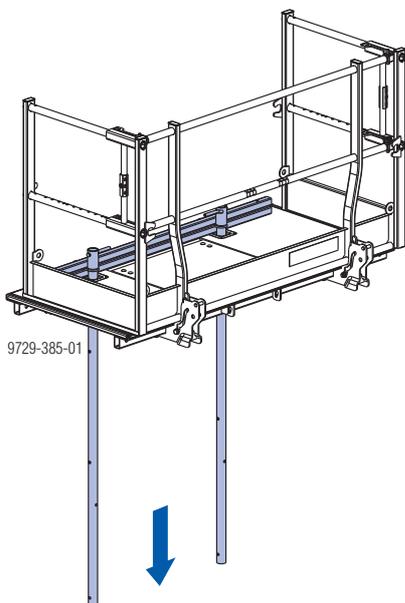
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## Railings facing formwork

The **Xsafe plus counter railing** is used to set up a front (formwork-side) railing. It can be operated (lowered / raised) both from below and from on the platform itself.



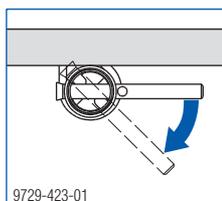
If the counter railing is not needed, it can simply be lowered into the platform.



### Lowering / raising the counter railing:

The counter railing is operated either by the lever (top) or the handrail-post upright (bottom).

- ▶ Slightly raise the counter railing.
- ▶ Twist the lever / handrail-post upright 45°



This unlocks the counter railing.

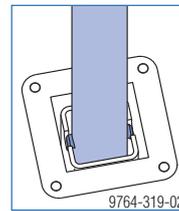
- ▶ Lower the counter railing or raise it to the same level as the platform railings.

- ▶ Twist the lever / handrail-post upright back 45°  
This locks the counter railing again.

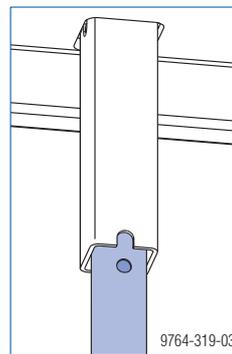


### Check whether properly locked:

- When operating the lever (top):  
The railing bolt must engage in the notch of the guide tube.

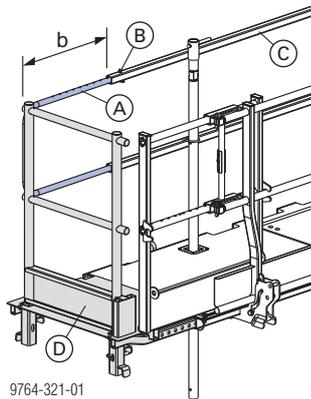


- When operating the handrail-post upright (bottom):  
The hole must align with the notch of the guide tube.



## Lengthening the counter railing to either side

The **Xsafe plus handrail lengthening piece** makes it possible to lengthen the counter railing to either side (e.g. if the platform has also been lengthened).



b ... can be telescoped between 13 cm and 68 cm, in a 5 cm grid

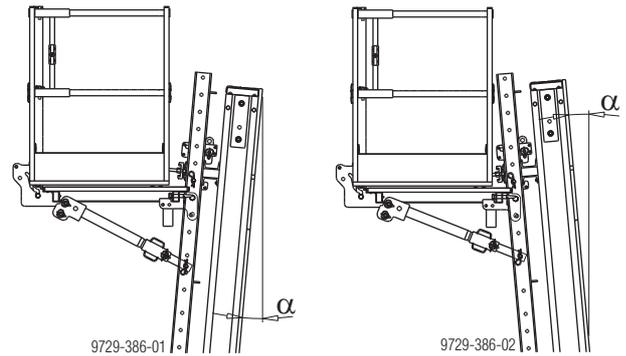
- A** Xsafe plus handrail lengthening piece
- B** Linch pin of Xsafe plus handrail lengthening piece
- C** Xsafe plus counter railing
- D** Xsafe plus platform extension 0.60m

### Note:

Counter railings with a handrail lengthening piece cannot be completely lowered.

## Adjusting the platform inclination

The Xsafe plus supporting strut makes it possible to adjust the inclination of the platform.

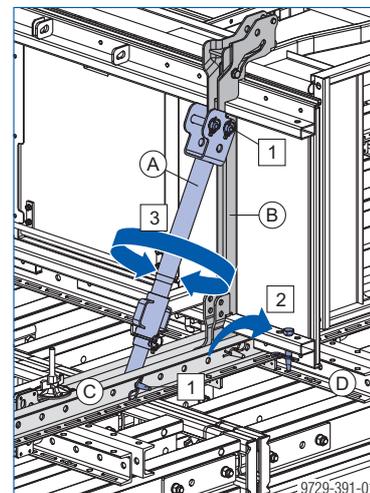


$\alpha$  ... up to approx. 5°

### Note:

For inclination adjustment, **two Xsafe plus supporting struts** are required on each platform.

- 1) Mount the Xsafe plus supporting strut between the platform and the multipurpose waling.
- 2) Remove a connecting pin 10cm (between the platform and the multipurpose waling).
- 3) Set the desired platform inclination by turning the screwjack mechanism on the Xsafe plus supporting strut.



- A** Xsafe plus supporting strut EB
- B** Xsafe plus platform
- C** Multipurpose waling
- D** Connecting pin 10cm

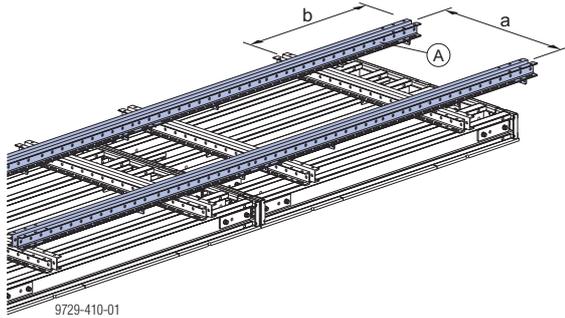
# Mounting the Xsafe plus platform onto the formwork

## Mounting the vertical multipurpose walings

**Note:**

For details of the lengths and positions of the vertical multi-purpose walings, see the section headed 'Rules for gang-forms'.

- Position the vertical multi-purpose walings on the formwork element.



**A** Multi-purpose waling

Xsafe plus platform	Centre-to-centre distance 'a'	Waling projection 'b'
2.00m	1240 mm	max. 1600 mm
1.00m	317 mm	

**Xsafe plus waling connectors:**

Permitted tensile load (when gang-form is crane-lifted into the upright): 25 kN

Permitted axial load (when gang-form is lifted and set down by crane): 14 kN

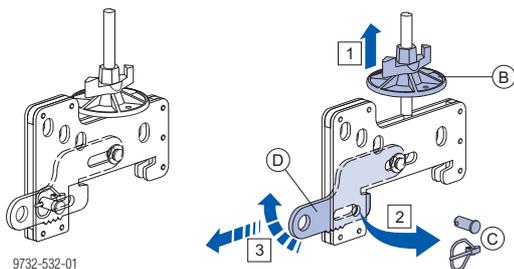
These values refer to the forces permitted between the steel waling and the vertical multi-purpose waling.

Force transmission between the steel waling and the Doka beam (e.g. Flange clamp H20) only needs to be verified in the following cases:

- Total weight of gang-form >2400 kg or
- Formwork height of gang-form >6.50 m

**Prepare the Xsafe plus waling connectors:**

- 1) Unscrew (i.e. raise) the super plate of the waling connector.
- 2) Remove the linch pin and pull out the bolt.
- 3) Tilt up the stop plate and pull it out.



**B** Super plate  
**C** Bolt with linch pin  
**D** Stop plate

**Note:**

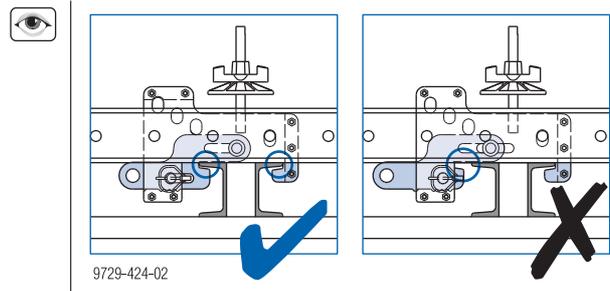
For details of the numbers of waling connectors per multi-purpose waling, see the section headed 'Rules for gang-forms'.

**Attach the vertical multi-purpose walings to the steel walings of the formwork element:**

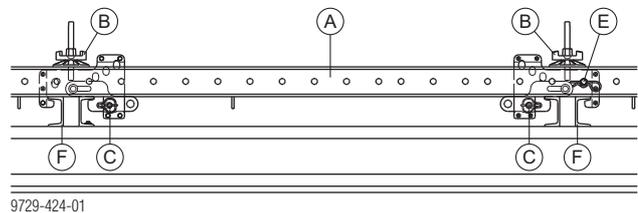
**WARNING**

⚠ Only use Xsafe plus waling connectors to make this connection!

- 1) Slot the waling connector into the vertical multi-purpose waling and hook it over the steel waling of the formwork element.
- 2) Clasp the stop plate around the steel waling of the formwork element.
- 3) Secure the stop plate with the bolt and linch pin.



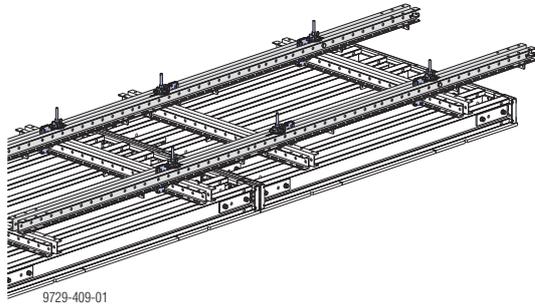
- 4) Re-adjust the vertical multi-purpose waling and fix it onto the waling connector with a connecting pin and spring cotter.
- 5) Tighten the super plate of the waling connector.
- 6) Mount the second waling connector. It is not necessary to fix the second waling connector with a connecting pin.



**A** Multi-purpose waling  
**B** Super plate  
**C** Bolt with linch pin  
**E** Connecting pin 10cm + Spring cotter 5mm  
**F** Steel waling



Adjust the vertical multi-purpose waling into its approximate position and only gently fasten it with the super plate of the waling connector. When the platforms are mounted (but not before this), align the vertical multi-purpose walings to the platform and tighten the super plates.

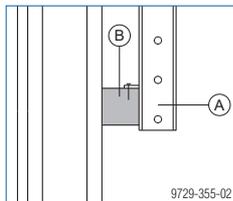


9729-409-01

**Note:**

The vertical multi-purpose walings also provide the necessary stiffening for the gang-form.

**Close-up of timber support**



9729-355-02

**A** Vertical multi-purpose waling

**B** Timber support 10x10cm



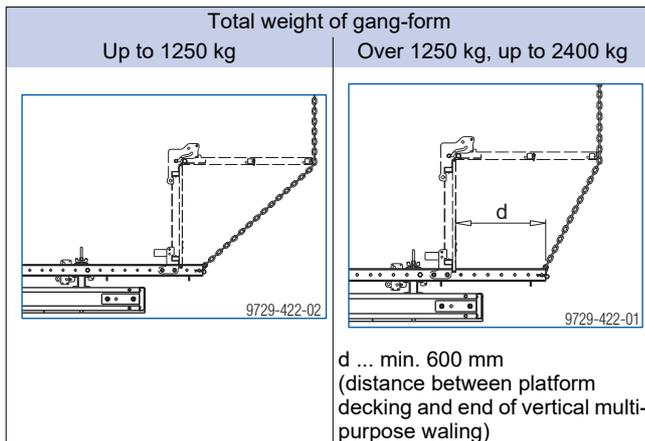
**NOTICE**

If the vertical multi-purpose waling is too short for stiffening against the bottommost waling, a timber support has to be used as pressure point.

**Longer vertical multipurpose walings on gang-forms of over 1250 kg**

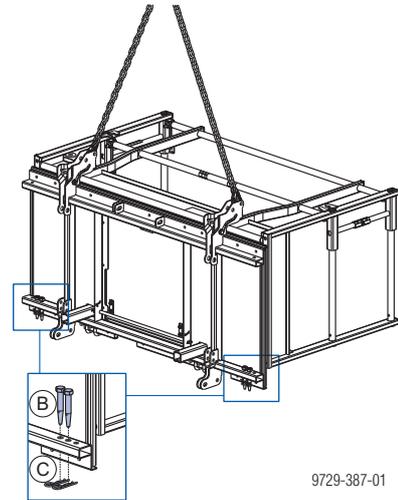
On gang-forms with a total weight of **more than 1250 kg** or with **more than one platform level**, the vertical multipurpose walings must project beyond the top of the formwork.

This reduces the load on the rear railings when the gang-form is lifted by crane.



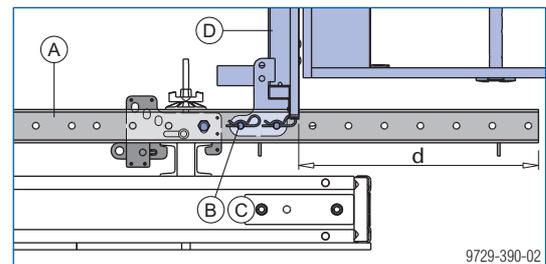
**Mounting the Xsafe plus platform**

- ▶ Raise the Xsafe plus platform by crane and lift it to the formwork.
- ▶ Remove the Connecting pins 10cm and Spring cot- ters 5mm of the Xsafe plus platform from their stand- by positions.



9729-387-01

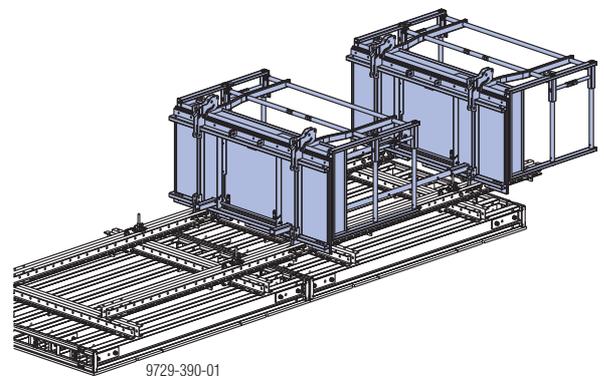
- ▶ Fix the Xsafe plus platform in the multipurpose wal- ing with the Connecting pins 10cm and Spring cot- ters 5mm.



9729-390-02

d ... min. 600 mm (distance between platform decking and end of ver- tical multipurpose waling) where total weight is over 1250 kg  
Leave the top hole of the multipurpose waling free for attaching the crane.

- ▶ Check that the multipurpose walings are properly attached (with Xsafe plus waling connectors), and tighten if necessary.



9729-390-01

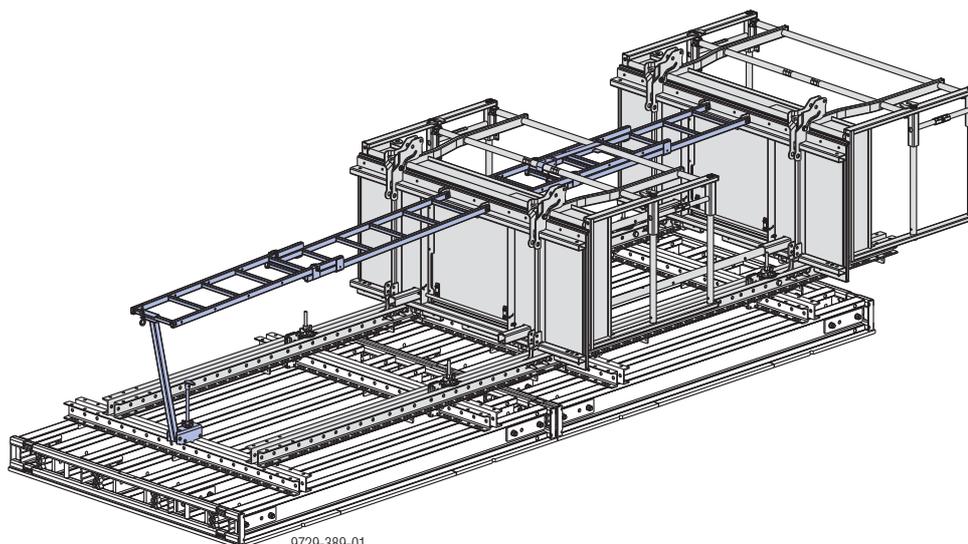
**A** Multi-purpose waling

**B** Connecting pin 10cm of the Xsafe plus platform

**C** Spring cotter 5mm of the Xsafe plus platform

**D** Xsafe plus platform

## Ladder system



To make it possible to **attach** the Xsafe plus telescopic ladders, the **Xsafe plus platforms** are equipped with a **ladder connection**.

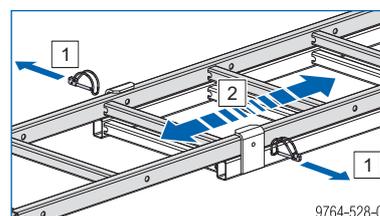
The Xsafe plus ladder starter piece is used for fixing a ladder **to the formwork**, and the Xsafe plus ladder support for fixing a ladder **to the rear railings** of the intermediate platform.

### Length adjustment of telescopic ladder

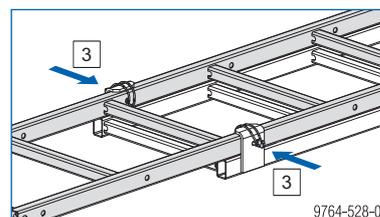
Extension range of the Xsafe plus telescopic ladder:  
**155 to 271 cm**

**Adjust the telescopic ladder to the required length:**

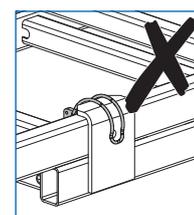
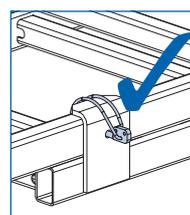
- 1) Remove both linch pins.
- 2) Telescope the ladder to the required length.



- 3) Reinsert both linch pins **from the outside toward the inside**.

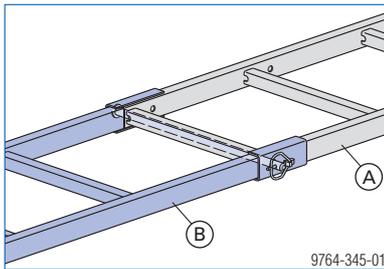


Before stepping on the ladder, check that the linch pins are correctly installed.



9764-528-03

## Extra lengthening of the telescoping ladder

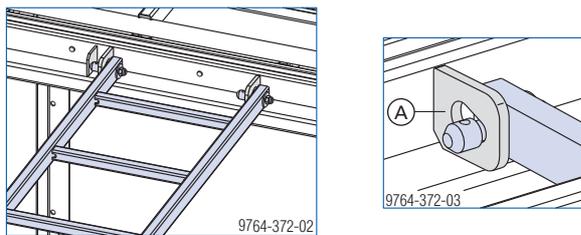


- A** Xsafe plus telescoping ladder
- B** Xsafe plus ladder extension 1.15m

**Note:**

The Xsafe plus telescoping ladder can be extended with **a maximum of two** Xsafe plus ladder extensions.

## Connecting the ladder to the Xsafe plus platform



- A** Integrated ladder connection on the Xsafe plus platform

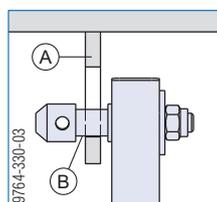
The integrated ladder connection secures the ladder against accidental lift-out.

**Note:**

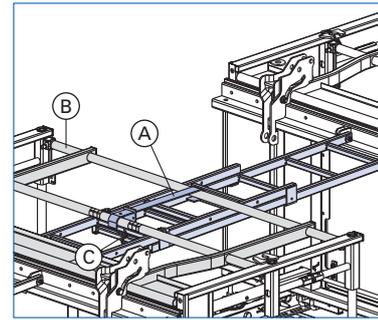
If desired, the ladder can also be secured with a linch pin as well.



The groove in the ladder pin (**B**) must be engaged in the hole of the ladder connection (**A**) !

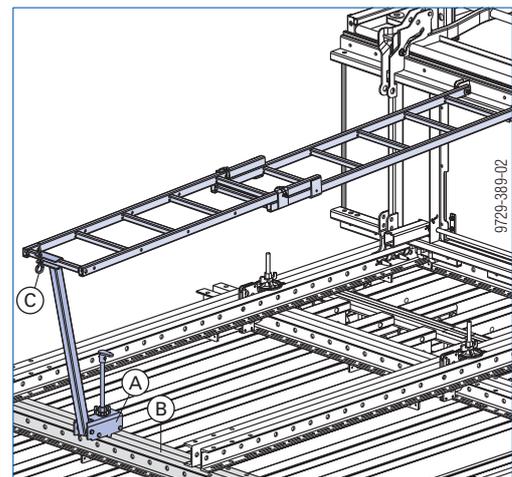


## Connecting the ladder to the rear railings



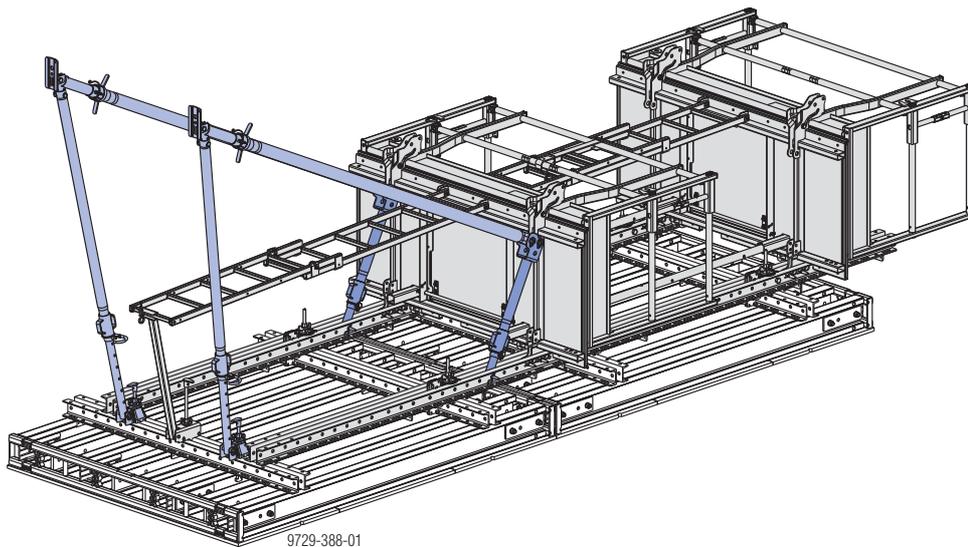
- A** Xsafe plus ladder support
- B** Rear railings of the Xsafe plus platform
- C** Spring cotter of the Xsafe plus ladder support

## Connecting the ladder to the formwork



- A** Xsafe plus ladder starter piece
- B** Multi-purpose waling of the formwork element FF20
- C** Spring cotter of the Xsafe plus ladder starter piece

## Plumbing accessories



Plumbing accessories brace the formwork against wind loads and make it easier to plumb and align.



### WARNING

#### Risk of the formwork tipping over!

- ▶ Formwork elements must be held stable in **every phase** of construction work!
- ▶ Observe all applicable safety regulations!
- ▶ If **high wind speeds** are likely, and when work finishes for the day or before prolonged work-breaks, always take extra precautions to fix the formwork in place.

#### Suitable precautions:

- set up the opposing formwork
- place the formwork against a wall
- anchor the formwork to the ground

## Determining the number of struts



### NOTICE

When using the table below, remember the following:

- Every gang-form must be supported by **at least 2 plumbing accessories**.
- The table is based on the **structural-design** requirements.
- The **geometrical** arrangement of platforms and plumbing accessories must be planned separately for each project.

For more information, please contact your Doka technician.

### Number of panel struts on 2.00 m wide element:

Formwork height [m]	Panel strut	
	340	540
up to 3.75	1	
up to 6.50		1

The values apply where the wind pressure  $w_e = 0.65 \text{ kN/m}^2$ . This results in an impact pressure  $q_p = 0.5 \text{ kN/m}^2$  (102 km/h) where  $c_{p, net} = 1.3$ . The greater wind loads encountered at exposed formwork-ends must be restrained by additional plumbing accessories (e.g. struts or pipe-braces). In cases where higher wind pressure is encountered, the number of struts must be determined by statical calculation!



For more information, see the Calculation Guide 'Wind loads to the Eurocodes', or consult your Doka technician!

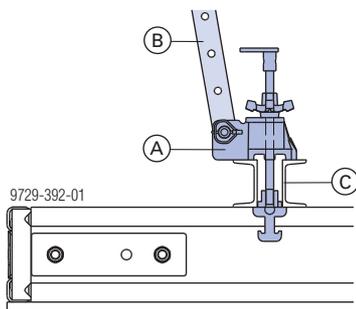
## Mounting the plumbing accessories

The location of the connection points for the plumbing accessories depends on how many platform levels there are on the gang-form:

- Gang-form with only **one platform level** (only a pouring platform, no intermediate platform):
  - panel struts are connected **to formwork**
- Gang-form with **more than one platform level** (pouring platform and intermediate platforms):
  - panel struts are connected **to top intermediate platform** (second Xsafe plus platform from top)

## Connecting panel struts to the formwork

- ▶ Mount the prop head to the panel strut.
- ▶ Fasten the panel strut to the formwork.

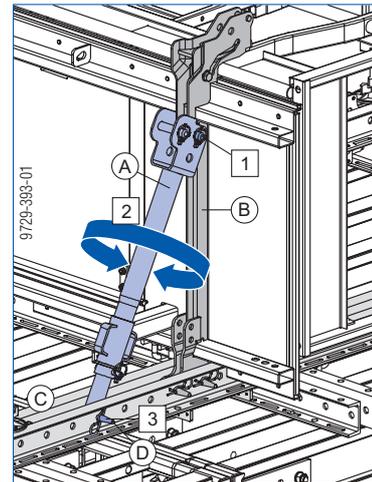


- A** Prop head EB
- B** Panel strut 340 IB, 540 IB or Eurex 60 550
- C** Multi-purpose waling

## Connecting panel struts to the Xsafe plus platform

**Mount the Xsafe plus supporting strut between the platform and the multipurpose waling:**

- 1)** Bolt the supporting strut to the platform and secure it with a linch pin.
- 2)** Turn the screwjack mechanism on the supporting strut to adjust it to the required length.
- 3)** Fix the supporting strut into the multipurpose waling with a Connecting pin 10cm and secure this with a spring cotter.

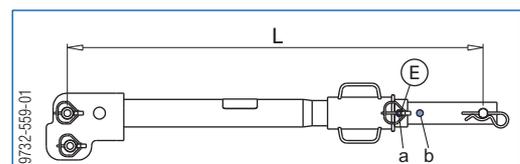


- A** Xsafe plus supporting strut EB
- B** Xsafe plus platform
- C** Multi-purpose waling
- D** Connecting pin 10cm of the Xsafe plus supporting strut EB

### Note:

The supporting strut can be modified to provide two different usable-length ranges.

This allows greater flexibility regarding the pinning position in the vertical multipurpose waling.

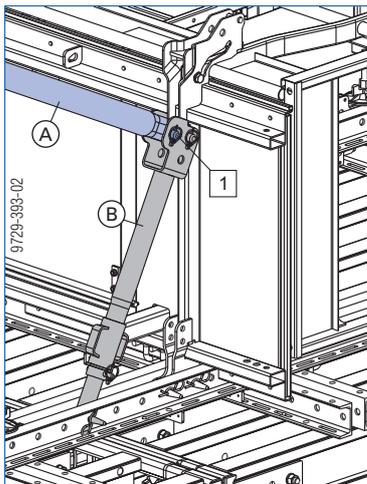


- (a) ... Usable length L: 836 - 912 mm
- (b) ... Usable length L: 881 - 957 mm

- E** Bolt + linch pin

**Mount the panel strut to the Xsafe plus supporting strut:**

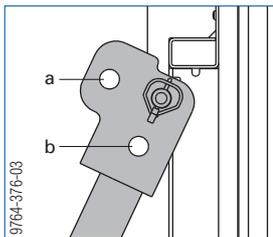
- 1) Bolt the panel strut to the Xsafe plus supporting strut and secure it with a linch pin.



**A** Panel strut 340 IB, 540 IB or Eurex 60 550  
**B** Xsafe plus supporting strut EB

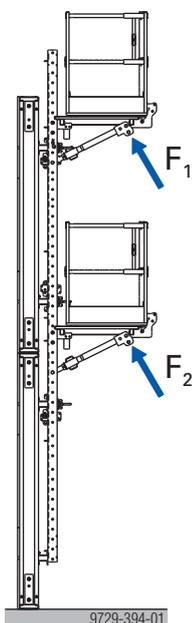
The panel strut can be bolted to the supporting strut in **2 positions**:

- As a **basic rule**, use Position (a).  
 - Advantage: more headroom on the platform.



**Xsafe plus supporting strut EB:**  
 Permitted connection forces (plumbing accessory -> supporting strut):

- Top platform (pouring platform):  $F_{1, perm.} = 10.0 \text{ kN}$
- Intermediate platform / bottom platform:  
 $F_{2, perm.} = 13.5 \text{ kN}$



**Fixing to the ground**

- Anchor the plumbing accessories in such a way as to resist tensile and compressive forces!

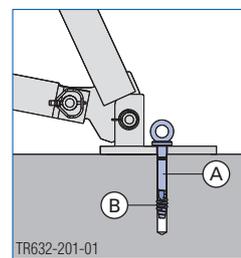
**Drilled holes in footplate**

Panel struts	Eurex 60 550

- a ... diam. 26 mm
- b ... diam. 18 mm (suitable for Doka express anchors)
- c ... diam. 28 mm
- d ... diam. 18 mm (suitable for Doka express anchors)

**Anchoring the footplate**

The **Doka express anchor** can be re-used many times over.



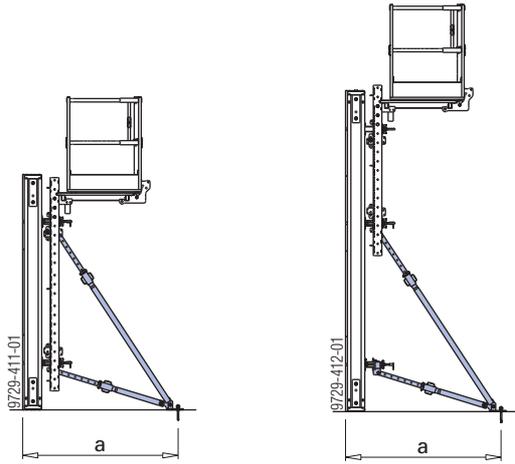
**A** Doka express anchor 16x125mm  
**B** Doka coil 16mm

Characteristic cube compressive strength of the concrete ( $f_{ck, cube}$ ):  
 min.  $15 \text{ N/mm}^2$  (C12/15 grade concrete)

Follow Fitting Instructions!

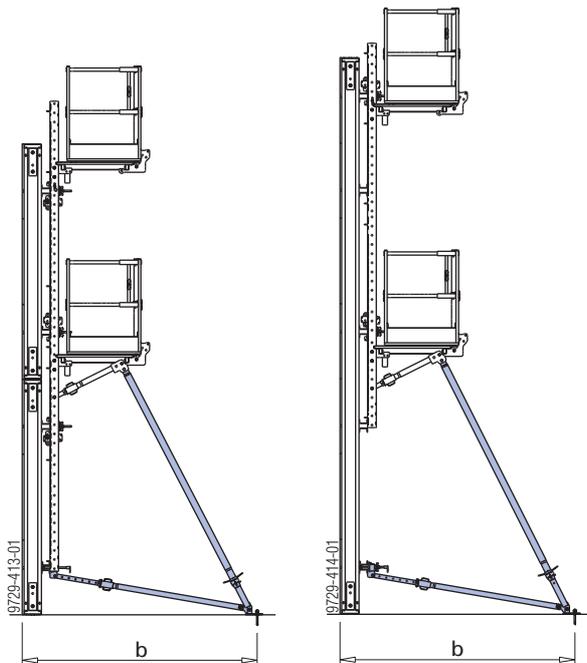
**Required safe working load of alternative anchors:**  
 $R_d \geq 20.3 \text{ kN}$  ( $F_{permissible} \geq 13.5 \text{ kN}$ )  
 Follow the manufacturers' applicable fitting instructions.

## Panel strut 340



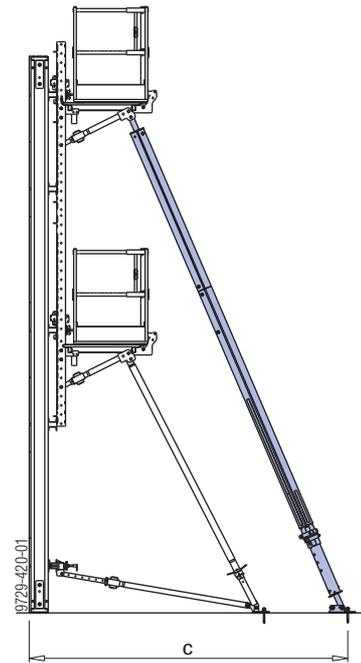
a ... 180.0 cm

## Panel strut 540



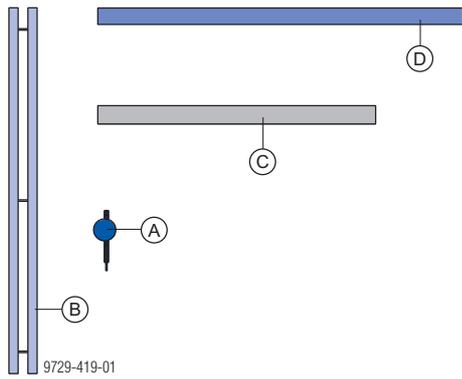
b ... 272.0 cm

## Eurex 60 550 used as a shoring & plumbing accessory



c ... 357.0 cm

## Rules for gang-forms



- A Xsafe plus waling connector
- B Vertical multi-purpose waling
- C Timber support 10x10cm
- D Xsafe plus platform

## Material list, Formwork elements FF20, sheet thickness 21 mm

### Gang-forms of width 2.0 m / 1.0 m

Height of basic element	Combination n°	Formwork height [m]	Element heights [m]		Number of connectors		Platform levels [cm]
			Element 1	Element 2	Number of vertical multi-purpose walings WS10	Number of Xsafe plus waling connectors	
2.75m	201	2.75	2.75		2 x 2.50m	4	254
	202	3.25	2.75	0.50	2 x 3.00m	4	297
3.75m	203	3.75	3.75		2 x 2.00m	4	364
	204	4.25	3.75	0.50	2 x 2.50m	4	396
	205	4.75	3.75	1.00	2 x 3.00m	6	421
2.75m	206	5.50	2.75	2.75	2 x 5.50m	6	302 / 529
6.50m	207	6.50	6.50		2 x 4.50m	4	307 / 596

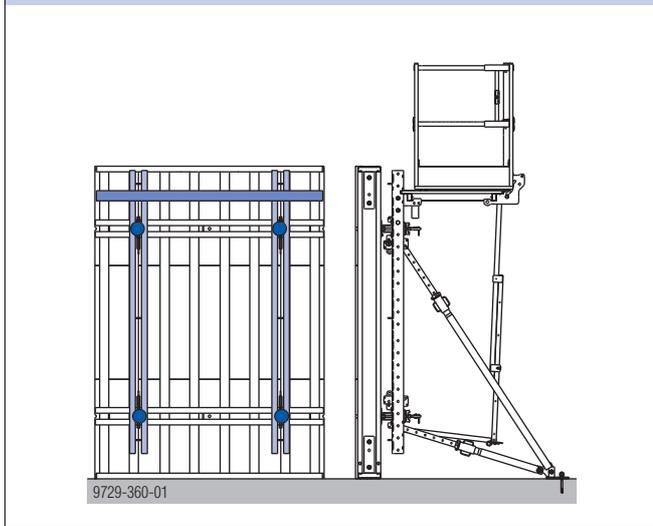
## Material list, Formwork elements FF20, sheet thickness 27 mm

### Gang-forms of width 2.0 m / 1.0 m

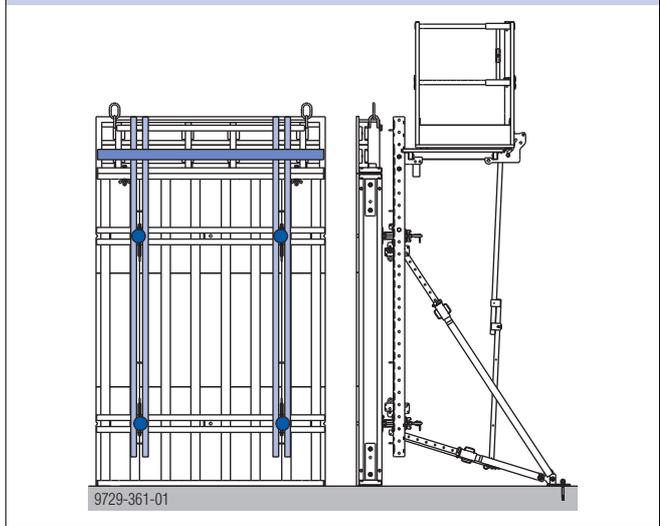
Height of basic element	Combination n°	Formwork height [m]	Element heights [m]			Number of connectors			Platform levels [cm]
			Element 1	Element 2	Element 3	Number of vertical multi-purpose walings WS10	Number of Xsafe plus waling connectors	Timber support at free end of waling	
2.75m	101	2.75	2.75			2 x 2.50m	4		254
	102	3.25	2.75	0.50		2 x 3.00m	4		297
	103	3.75	2.75	1.00		2 x 3.00m	4	X	364
	104	4.25	2.75	1.00	0.50	2 x 3.00m	4	X	396
	105	4.75	2.75	1.00	1.00	2 x 3.50m	6	X	421
	106	5.50	2.75	2.75		2 x 5.50m	6		302 / 529
	107	6.50	2.75	2.75	1.00	2 x 6.00m	8	X	307 / 596

## Formwork elements FF20 sheet thickness 21 mm

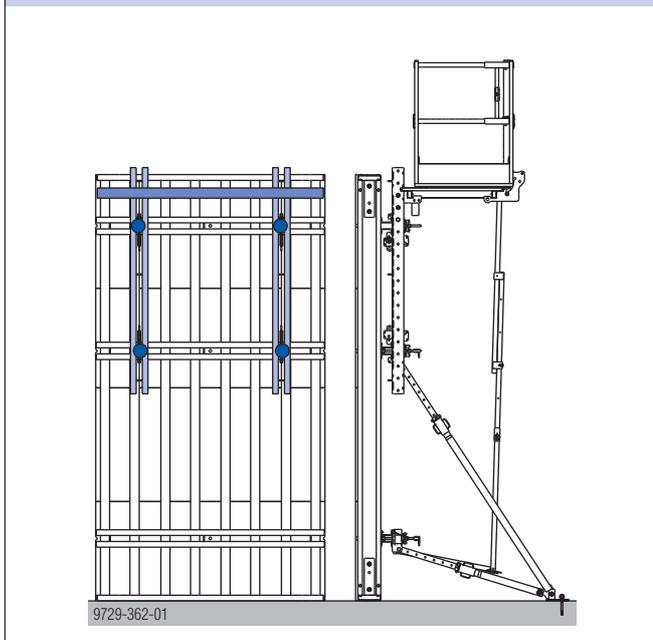
Combination n° 201  
Formwork height: 2.75 m  
Formwork width: 2.0 m



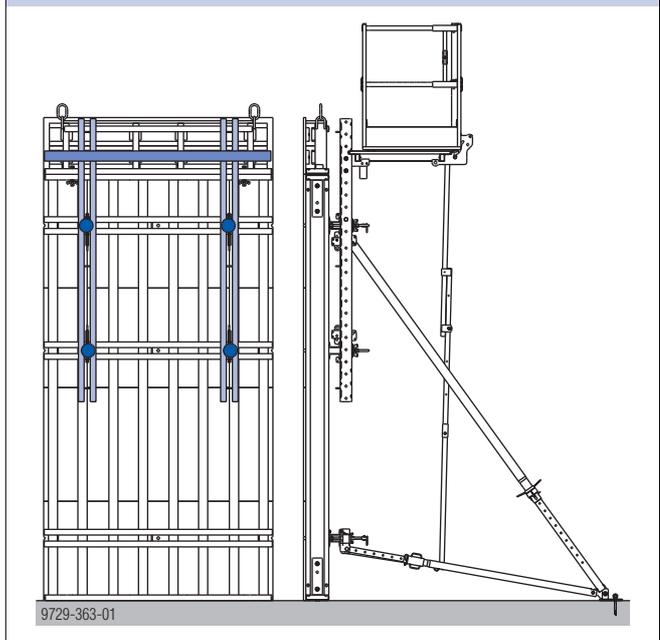
Combination n° 202  
Formwork height: 3.25 m  
Formwork width: 2.0 m



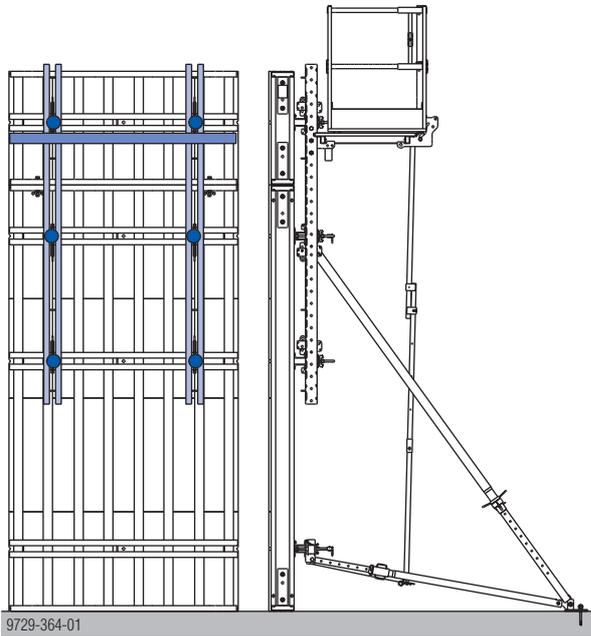
Combination n° 203  
Formwork height: 3.75 m  
Formwork width: 2.0 m



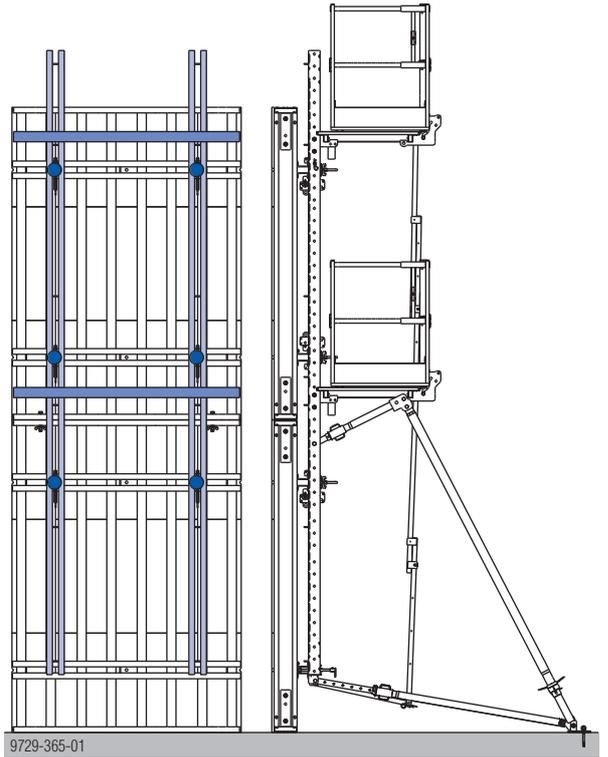
Combination n° 204  
Formwork height: 4.25 m  
Formwork width: 2.0 m



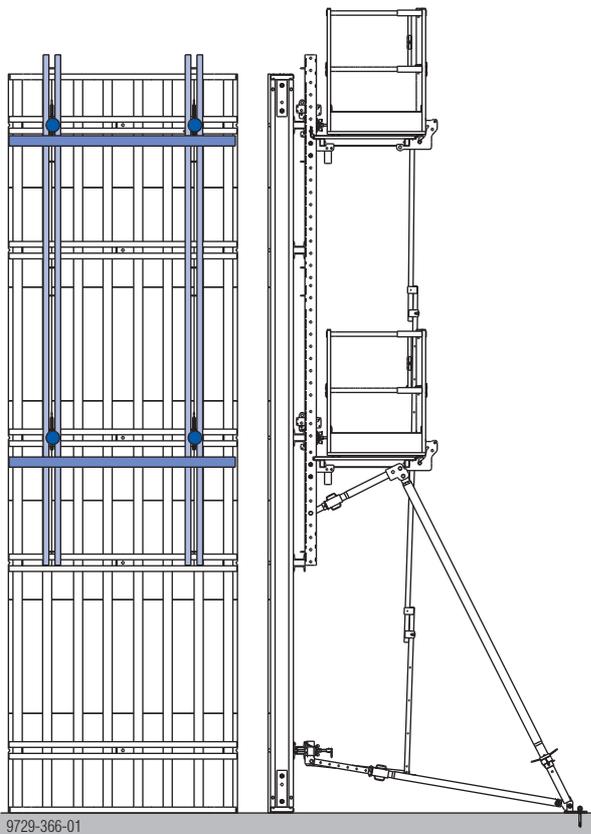
**Combination n° 205**  
 Formwork height: **4.75 m**  
 Formwork width: **2.0 m**



**Combination n° 206**  
 Formwork height: **5.50 m**  
 Formwork width: **2.0 m**

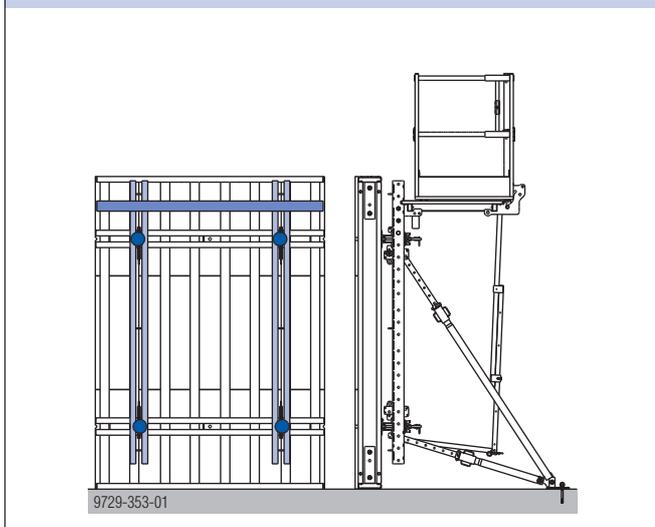


**Combination n° 207**  
 Formwork height: **6.50 m**  
 Formwork width: **2.0 m**

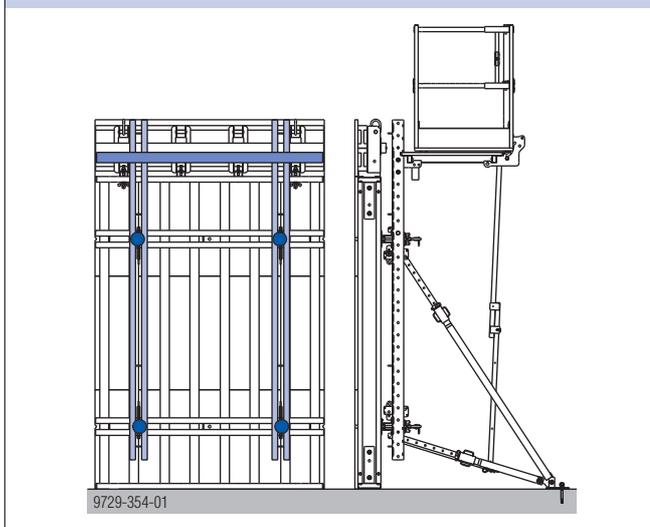


## Formwork elements FF20 sheet thickness 27 mm

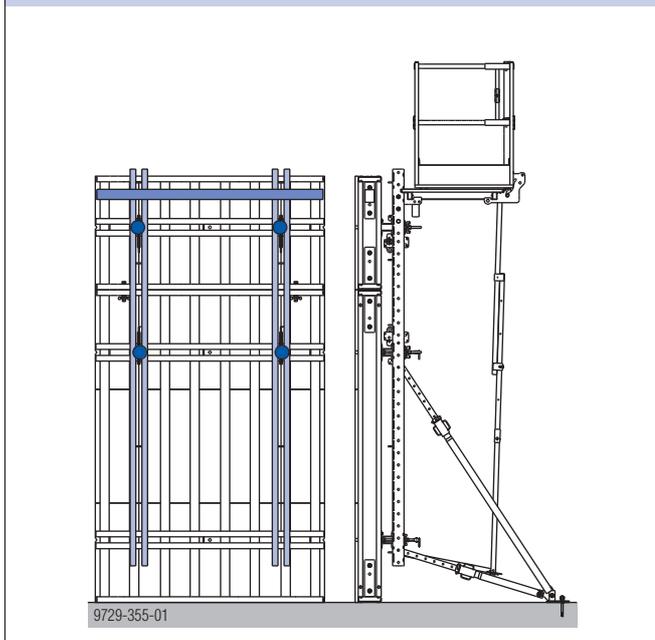
Combination n° 101  
Formwork height: 2.75 m  
Formwork width: 2.0 m



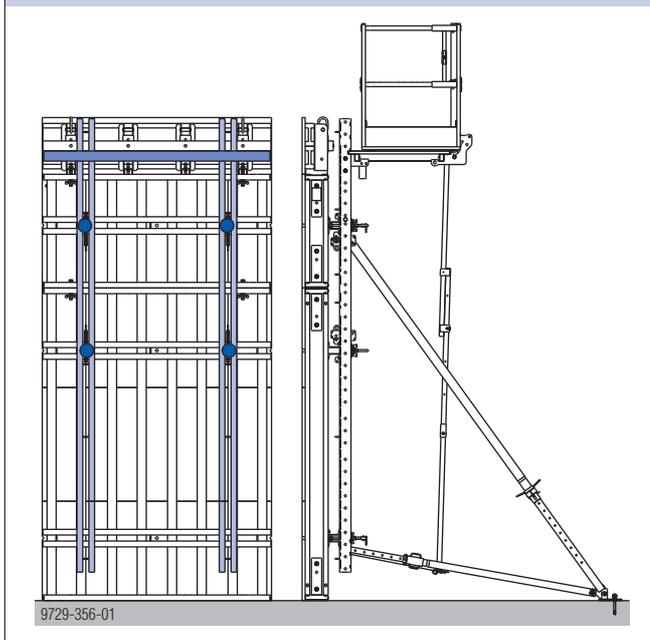
Combination n° 102  
Formwork height: 3.25 m  
Formwork width: 2.0 m



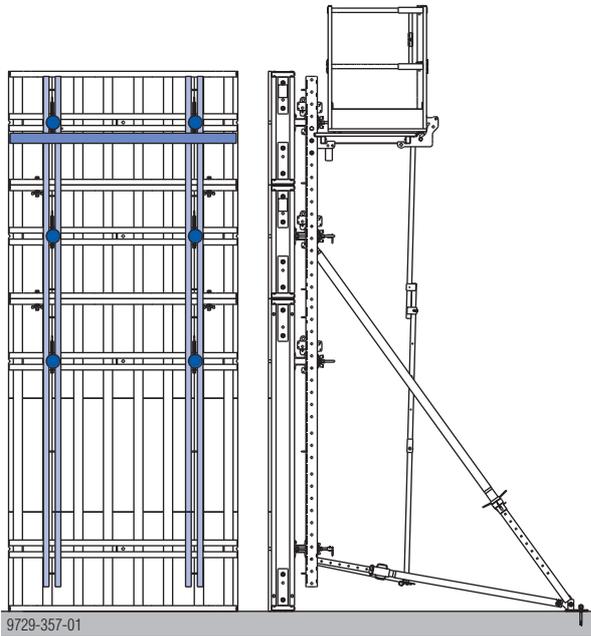
Combination n° 103  
Formwork height: 3.75 m  
Formwork width: 2.0 m



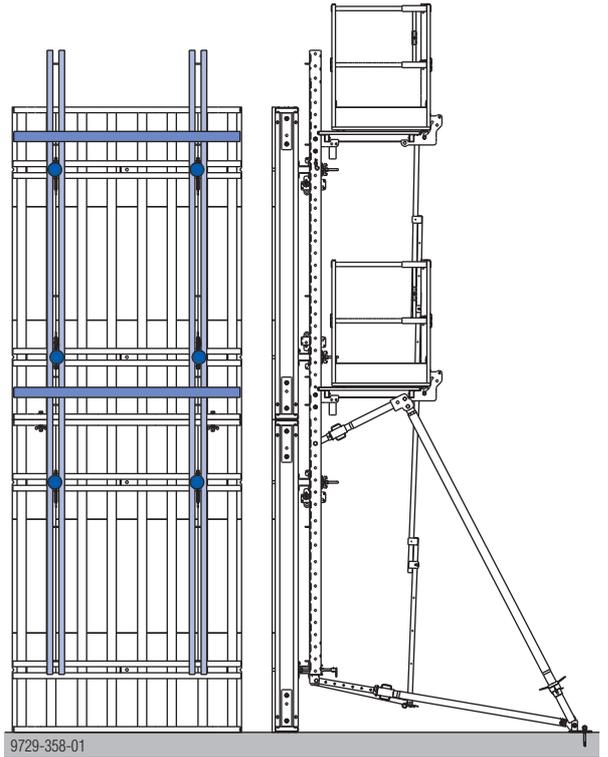
Combination n° 104  
Formwork height: 4.25 m  
Formwork width: 2.0 m



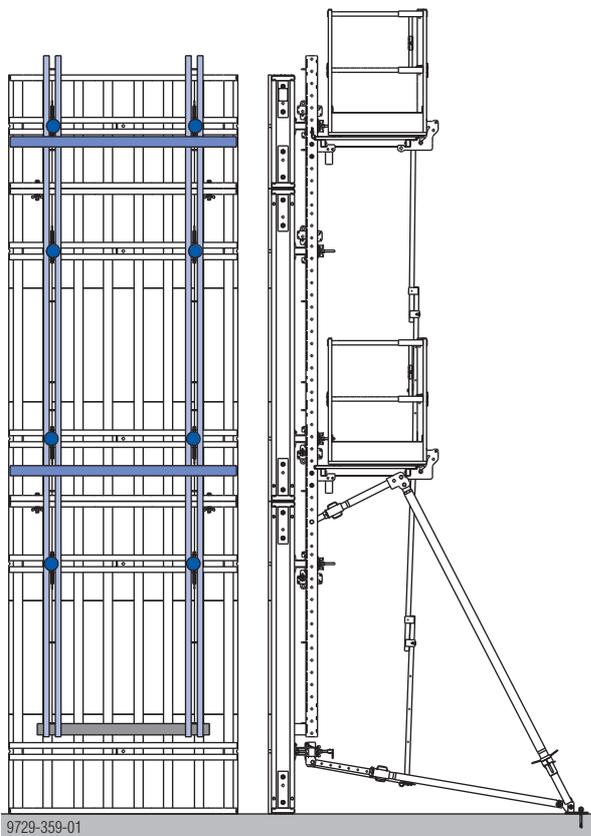
**Combination n° 105**  
 Formwork height: **4.75 m**  
 Formwork width: **2.0 m**



**Combination n° 106**  
 Formwork height: **5.50 m**  
 Formwork width: **2.0 m**

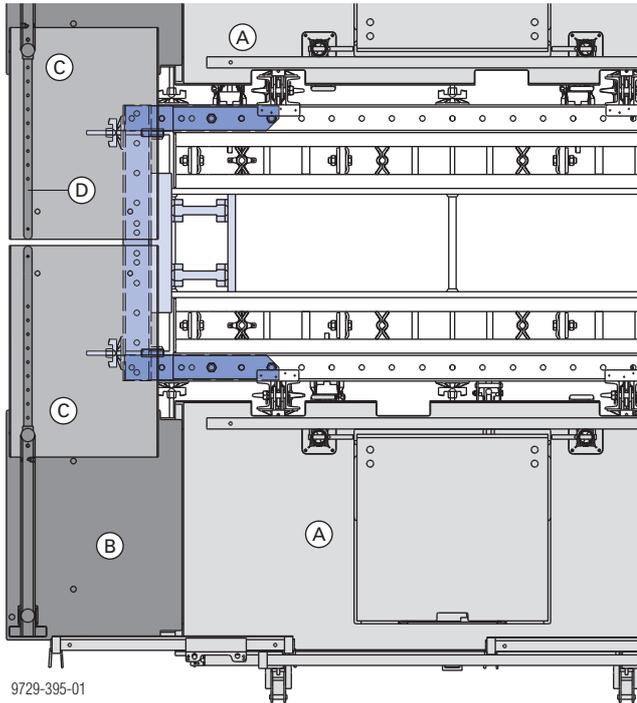


**Combination n° 107**  
 Formwork height: **6.50 m**  
 Formwork width: **2.0 m**



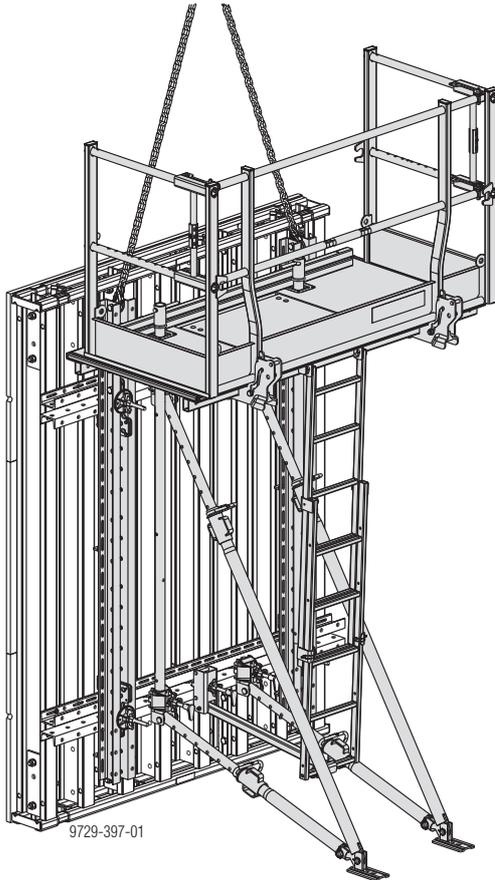
# Stop-end formwork

## Wall thicknesses up to 45 cm



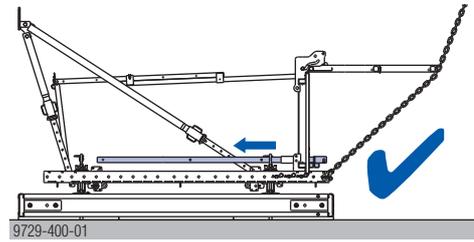
- A Xsafe plus platform
- B Xsafe plus platform extension 0.60m
- C Xsafe plus platform transition
- D Xsafe plus handrail extension

## Lifting by crane

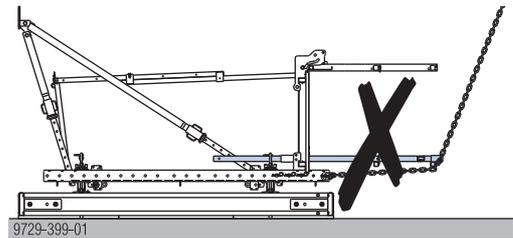


- It is only allowed to raise or set down the gang-form after the **Xsafe plus counter-railing** has been pushed in (lowered).

Right:

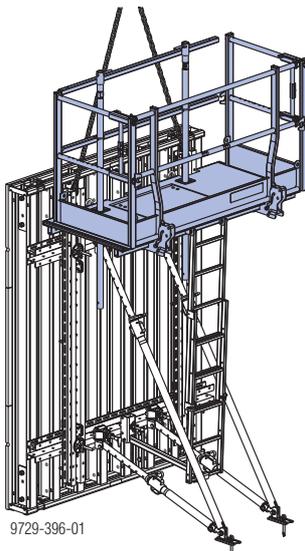


Wrong:

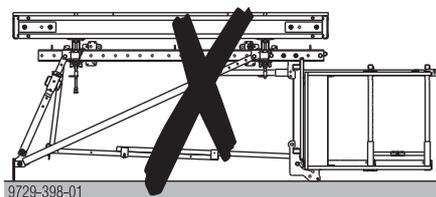


For gang-forms with Xsafe plus platforms, observe the following points:

- It is only allowed to **operate** the crane slinging points when the platform railings are in place on all sides.



- Do not set down the gang-form on the platform.

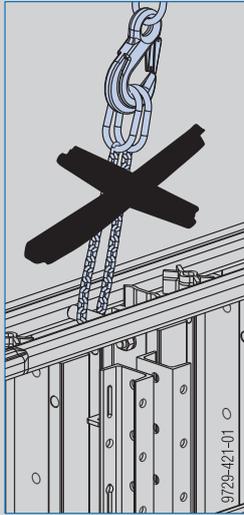


## Crane hoisting points



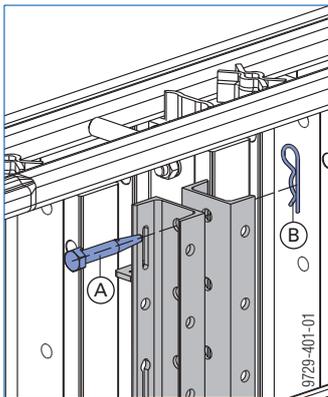
### WARNING

- Do **not** use the integral crane lifting points in the stacking flanges of the elements to lift, lay down or reposition the entire unit.



### Mounting the crane lifting points:

- Fit a Connecting pin 10cm in the top hole of both vertical multi-purpose walings.



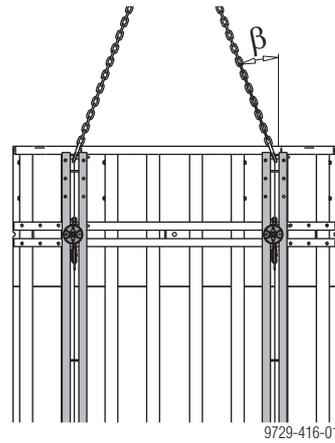
A Connecting pin 10cm

B Spring cotter 5mm

### Max. load-bearing capacity:

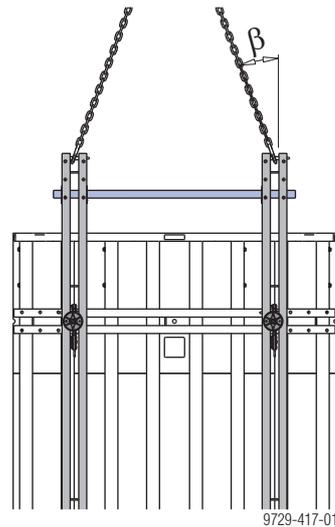
1200 kg per Connecting pin 10cm

## Gang-form up to 1250 kg (approx. 9 m<sup>2</sup>)



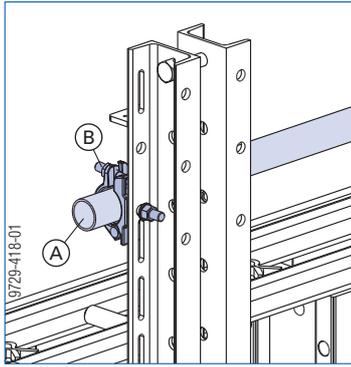
$\beta$  ... max. 30°

## Gang-form of over 1250 kg and up to 2400 kg (approx. 18 m<sup>2</sup>)



Weight of gang-form	$\beta$
Up to 1600 kg	max. 30°
Over 1600 kg, up to 2400 kg	max. 15°

## Pressure bracing between the vertical multipurpose walings



- A Scaffold tube 48.3mm
- B Screw-on coupler 48mm 50

## Stripping and repositioning the panels

**Before lifting:** Remove any loose items from the formwork and platforms, or secure them firmly.

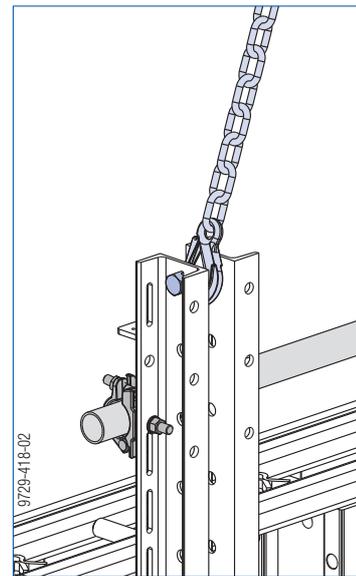


### WARNING

The formwork tends to adhere to the concrete. When stripping the formwork, do not try to break concrete cohesion using the crane! Risk of crane overload.

► Use suitable tools such as timber wedges or a special pry-bar to detach the formwork from the concrete.

- Attach the lifting chain to the two Connecting pins 10cm.

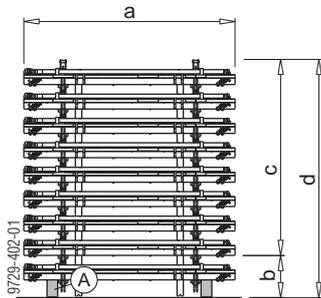


- Lift the gang-form to its new location (guide with tag-lines if necessary).

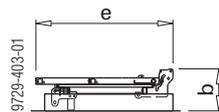
# Transporting, stacking and storing

## Stacking the Xsafe plus platforms

Stack of 9 Xsafe plus platforms

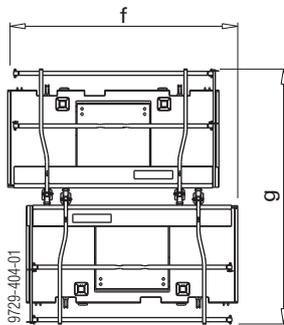


Single folded-down platform



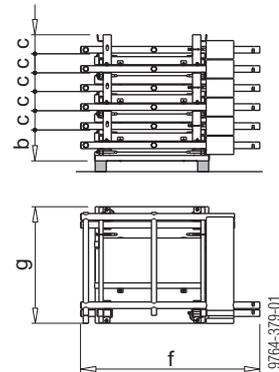
**A** Hardwood blocking 16cm

Arrangement of stacks for truck shipments (plan view):



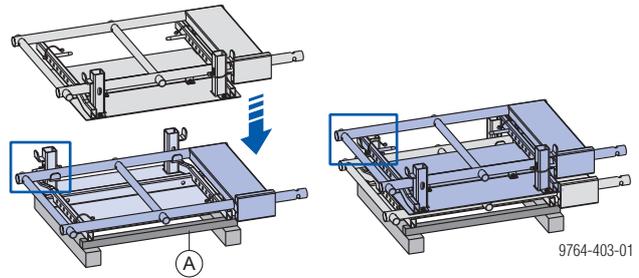
	Xsafe plus platform	
	2.00m	1.00m
a	198 cm	98 cm
b	36.5 cm	36.5 cm
c	8 x 23 cm	8 x 23 cm
d	224 cm	224 cm
e	128 cm	128 cm
f	220 cm	120 cm
g	Platforms with side railings: 238 cm Platforms without side railings: 242 cm	

## Stacking the Xsafe plus platform extensions 0.60m

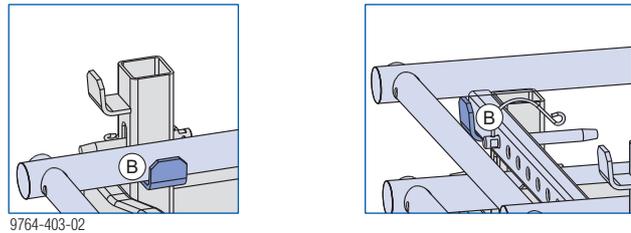


- b ... 22.5 cm
- c ... 14.0 cm
- f ... 131.0 cm
- g ... 85.5 cm

How to arrange them in the stack:



Close-ups showing the stacking stirrup:



- A** Squared timber 4x4 cm
- B** Stacking stirrup

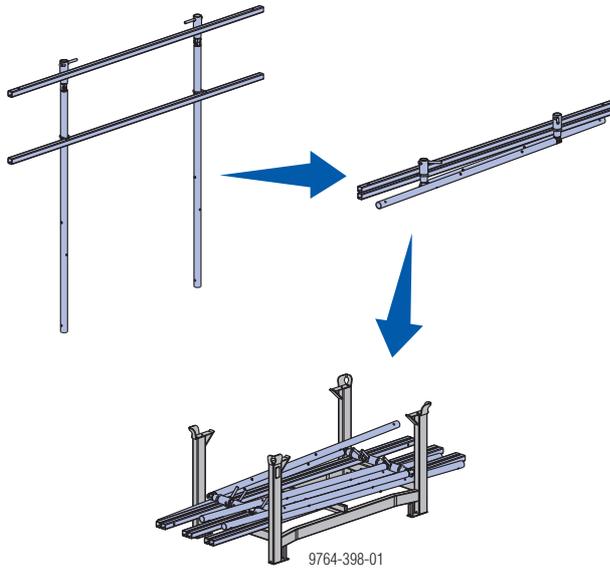
## Transporting the stacked platforms

The entire stack of platforms can be transported by crane with a four-part lifting chain.

- ▶ Guide the four-part lifting chain through the platform-stack from above.
- ▶ Attach the four-part lifting chain to the crane hoisting lugs of the bottom platform.
- ▶ Raise the platform-stack by crane.

## Storing the Xsafe plus counter railings

- ▶ Fold each Xsafe plus counter railing together and store it in a stacking pallet.

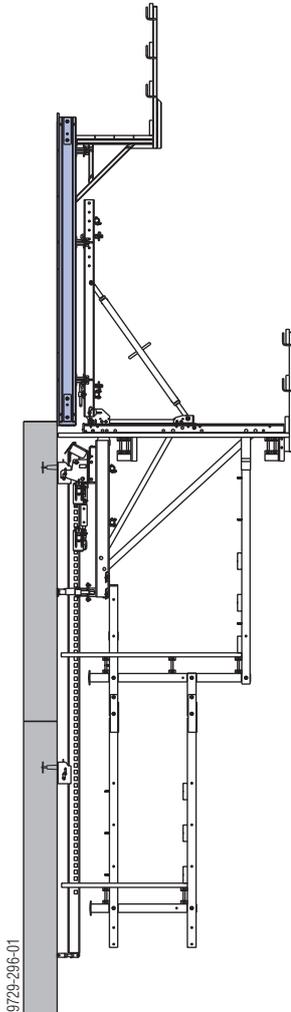


## Other possible areas of use

### FF20 combined with . . .

#### Doka automatic climbing formwork

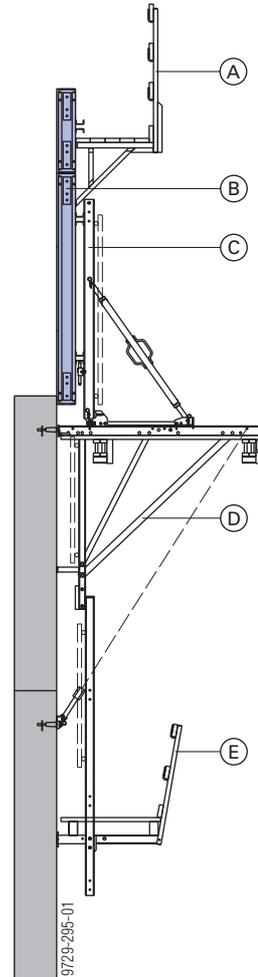
With their modular design concept, these crane-independent automatic climbing formwork systems provide an efficient solution for every type of structure.



Follow the directions in the relevant User Information booklet!

#### Doka climbing formwork MF240

Climbing formwork MF240 proves its versatility on all tall structures. The formwork and climbing scaffold are linked together as a single unit which can be repositioned in one single crane cycle.



- A Universal bracket 90
- B Formwork element FF20
- C Travelling unit MF
- D Climbing bracket MF240
- E Suspended platform MF75 5.00m



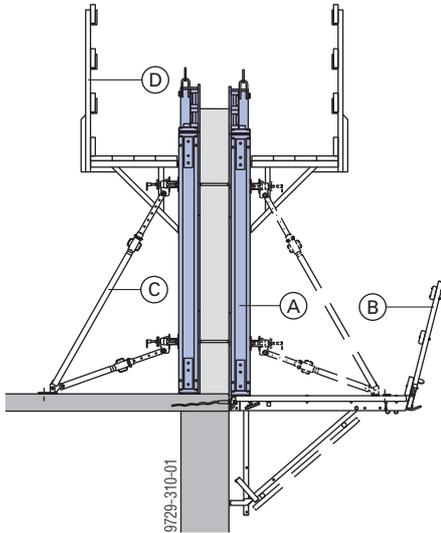
Follow the directions in the 'Climbing formwork MF240' User Information booklet!

## Doka folding platforms

The high capacity of these working and safety scaffolds means that the formwork can safely be stood on the folding platforms.

Adding a few standard parts converts your working platform into a climbing formwork unit which can be repositioned as a complete form and access-platform in one single operation.

This makes work at great heights faster and more efficient.



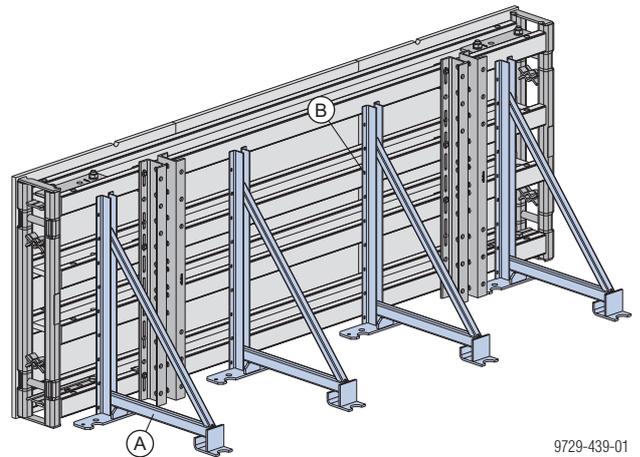
- A** Formwork element FF20
- B** Folding platform K
- C** Panel strut
- D** Universal bracket 90



Follow the directions in the 'Folding platform K' and 'Climbing formwork K' User Information booklets!

## Supporting construction

The Supporting construction is used for erecting non-tied, single-sided formwork up to 1.20 m high (e.g. stop ends of floor slabs).



- A** Supporting construction
- B** Nail 28x65

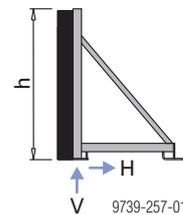


### NOTICE

Transfer the vertical and horizontal forces by suitable means!

e.g.:

- 2 ground nails per Supporting construction.
- Anchoring with dowel in the blinding layer.

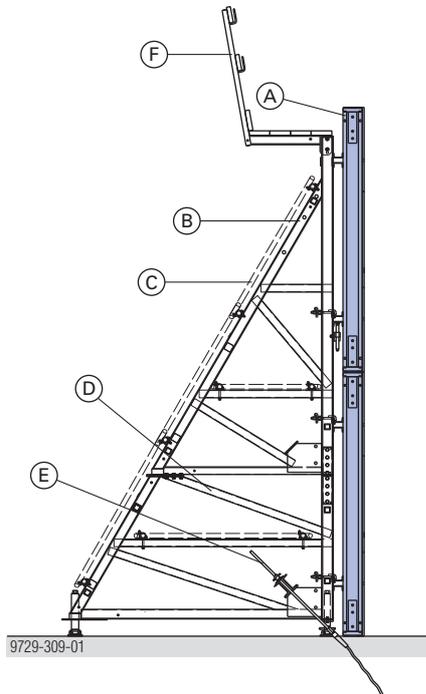


Pour height h [m]	Influence width [m]	Vertical force V [kN]	Horizontal force H [kN]
0.30	3.00	0.00	3.40
0.45	3.00	0.20	7.60
0.60	1.80	1.00	8.10
0.75	1.15	1.80	8.10
0.90	0.80	2.60	8.10
1.05	0.60	3.40	8.10
1.20	0.45	4.10	8.10

## Doka supporting construction frames

The **Doka supporting construction frames** also enable the sturdy elements to be used as single-sided wall formwork.

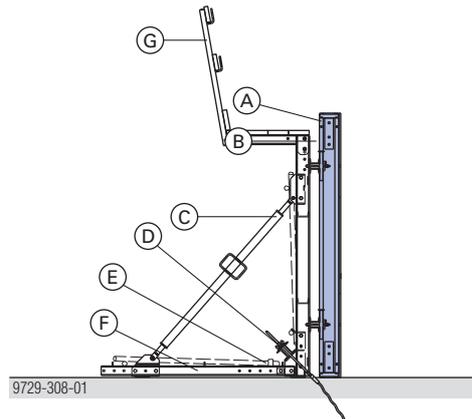
### Supporting construction frame "Universal"



- A** Formwork element FF20
- B** Supporting construction frame Universal F 4.50m
- C** Bracing
- D** Attachable frame F 1.50m
- E** Tension anchoring
- F** Screw-on access bracket MF75

 Follow the directions in the 'Supporting construction frame "Universal"' User Information booklet.

### Supporting construction frame "Variable"



- A** Formwork element FF20
- B** Waling WU14 for supporting construction frame
- C** Spindle strut 12 3.00m
- D** Tension anchoring
- E** Bracing
- F** Multi-purpose waling WS10 Top50 2.00m
- G** Screw-on access bracket MF75 with Swivel plate MF

 Follow the directions in the 'Supporting construction frame "Variable"' User Information booklet.

# General

## Cleaning and care of your equipment

### Release agents

Doka-Trenn or Doka-OptiX is applied using the Doka release-agent sprayer.



Follow the directions in the 'Doka release-agent sprayer' Operating Instructions and on the containers of release agent.



#### NOTICE

- Before every pour:
  - Apply release agent to the formwork sheet and the end faces **extremely thinly, evenly** and **in a continuous layer**.
- Make sure there are no drips of release-agent running down the formwork sheet.
- Applying too much release agent will spoil the concrete finish.



To determine the right dosage and to make sure that you are using the agent correctly, test it on less important parts of the structure first.

### Cleaning



#### NOTICE

- Immediately after pouring:
  - Remove any blobs of concrete from the back-face of the formwork, using water (without any added sand).
- Immediately after stripping the formwork:
  - Clean the formwork with a high-pressure washer and a concrete scraper.
- Do not use any chemical cleaning agents!



#### Cleaning high formwork:

Provide a service tower at a suitable cleaning location.

- Wheel-around scaffold DF (up to a formwork height of 3.90 m)
- Working scaffold Modul (up to a formwork height of 6.70 m)

## Cleaning equipment

### High-pressure spray cleaner

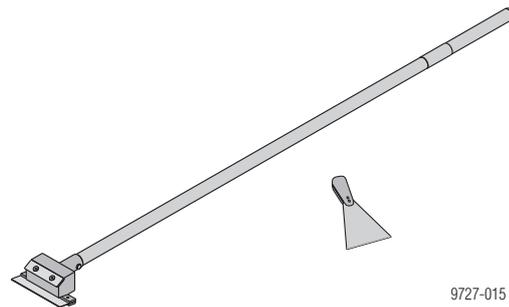


#### NOTICE

- Appliance pressure rating: 200 to max. 300 bar
- Keep the water-jet the correct distance from the formwork, and move it at the right speed:
  - The higher the pressure, the further away from the formwork you must keep the jet and the faster you must move it across the surface.
- Do not aim the jet at one place for too long.

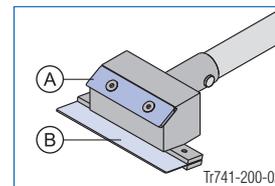
### Concrete scraper

For removing any concrete remnants, we recommend using a **Double scraper Xlife** and a spatula.

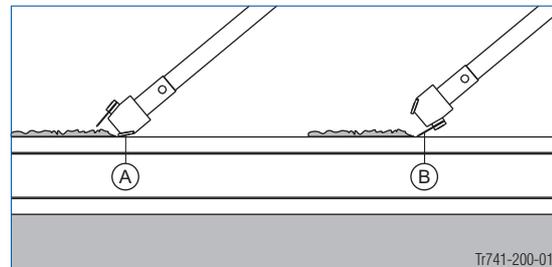


9727-015

#### Functional description:



Tr741-200-02



Tr741-200-01

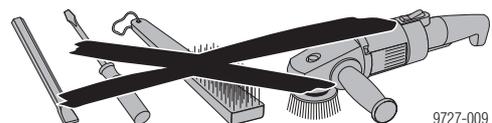
**A** Blade for dealing with heavy soiling

**B** Blade for dealing with slight soiling



#### NOTICE

Do not use pointed or sharp objects, wire brushes, abrasive disks or cup brushes.

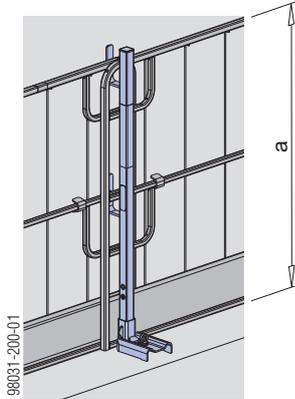


9727-009

## Fall-arrest systems on the structure

### Handrail post XP 1.20m

- Attached with Screw-on shoe XP, railing clamp, Handrail-post shoe or Step bracket XP
- Protective grating XP, guardrail boards or scaffold tubes can be used as the safety barrier



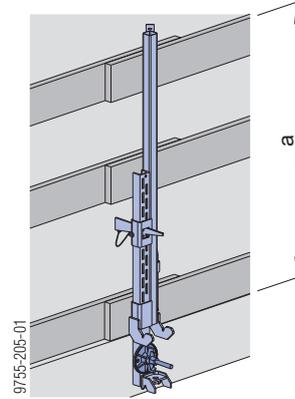
a ... > 1.00 m



Follow the directions in the 'Edge protection system XP' User Information booklet!

### Handrail clamp T

- Fixed in embedded anchoring components or reinforcement hoops
- Guard-rail boards or scaffold tubes can be used as the safety barrier



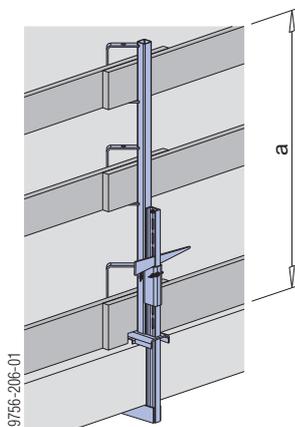
a ... > 1.00 m



Follow the directions in the 'Handrail clamp T' User Information!

### Handrail clamp S

- Attached with integral clamp
- Guard-rail boards or scaffold tubes can be used as the safety barrier



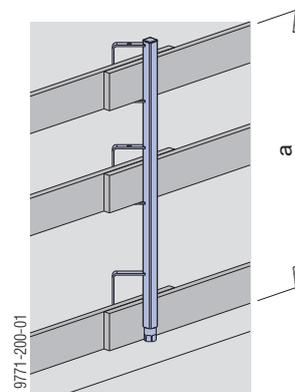
a ... > 1.00 m



Follow the directions in the "Handrail clamp S" User information!

### Handrail post 1.10m

- Fixed in a Screw sleeve 20.0 or Attachable sleeve 24mm
- Guard-rail boards or scaffold tubes can be used as the safety barrier

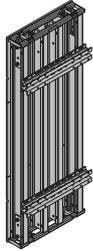


a ... > 1.00 m

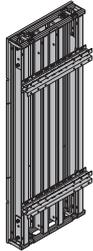


Follow the directions in the 'Handrail post 1.10m' User Information!

	[kg]	Article N°
Formwork element FF20 2.00x2.75m 21mm	335.0	587512000
Formwork element FF20 1.00x2.75m 21mm	166.0	587508000
Formwork element FF20 0.75x2.75m 21mm	131.0	587504000
Formwork element FF20 0.50x2.75m 21mm	92.0	587500000
Formwork element FF20 2.00x1.00m 21mm	190.0	587523000
Formwork element FF20 1.00x1.00m 21mm	95.0	587522000
Formwork element FF20 0.75x1.00m 21mm	79.5	587521000
Formwork element FF20 0.50x1.00m 21mm	58.0	587520000
Formwork element FF20 2.00x3.75m 21mm	440.0	587564000
Formwork element FF20 1.00x3.75m 21mm	224.0	587562000
Formwork element FF20 0.75x3.75m 21mm	172.0	587561000
Formwork element FF20 0.50x3.75m 21mm	120.0	587560000
Formwork element FF20 2.00x6.50m 21mm	692.0	587563000
Formwork element FF20 1.00x6.50m 21mm	346.0	587565000
Formwork element FF20 0.75x6.50m 21mm	272.0	587566000
Formwork element FF20 0.50x6.50m 21mm	189.5	587567000
Fertigelement FF20 21mm		



Formwork element FF20 2.00x2.75m 27mm	348.0	587606000
Formwork element FF20 1.00x2.75m 27mm	173.0	587604000
Formwork element FF20 0.75x2.75m 27mm	136.0	587602000
Formwork element FF20 0.50x2.75m 27mm	96.0	587600000
Formwork element FF20 2.00x1.00m 27mm	195.0	587616000
Formwork element FF20 1.00x1.00m 27mm	103.0	587614000
Formwork element FF20 0.75x1.00m 27mm	81.5	587612000
Formwork element FF20 0.50x1.00m 27mm	59.5	587610000
Fertigelement FF20 27mm		



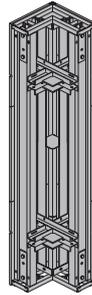
Stacking element FF20 2.00x0.50m 21mm	90.5	587529000
Stacking element FF20 1.00x0.50m 21mm	45.4	587528000
Stacking element FF20 0.75x0.50m 21mm	36.4	587527000
Stacking element FF20 0.50x0.50m 21mm	27.5	587526000
Aufstockelement FF20 21mm		



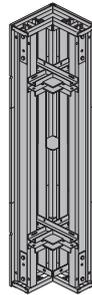
Stacking element FF20 2.00x0.50m 27mm	67.5	587626000
Stacking element FF20 1.00x0.50m 27mm	33.4	587624000
Stacking element FF20 0.75x0.50m 27mm	28.8	587622000
Stacking element FF20 0.50x0.50m 27mm	21.0	587620000
Aufstockelement FF20 27mm		



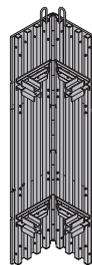
	[kg]	Article N°
Inside corner FF20 2.75m 21mm	214.0	587516000
Inside corner FF20 1.00m 21mm	117.0	587525000
Innenecke FF20 21mm		



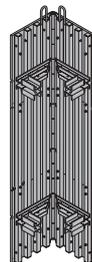
Inside corner FF20 2.75m 27mm	220.0	587608000
Inside corner FF20 1.00m 27mm	120.0	587618000
Inside corner FF20 0.50m 27mm	33.5	587628000
Innenecke FF20 27mm		



Swivelling inside corner FF20 2.75m 21mm	246.5	587577000
Swivelling inside corner FF20 1.00m 21mm	103.0	587575000
Swivelling inside corner FF20 0.50m 21mm	53.7	587573000
Gelenkinnenecke FF20 21mm		

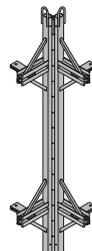


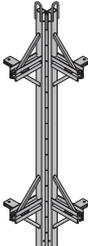
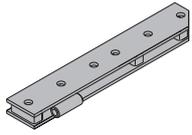
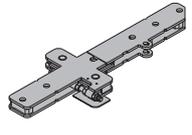
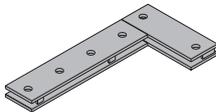
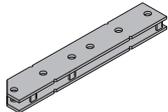
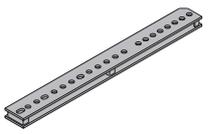
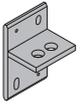
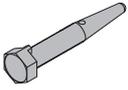
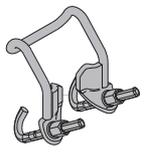
Swivelling inside corner FF20 0.50m 27mm	55.0	587647000
Swivelling inside corner FF20 1.00m 27mm	108.8	587649000
Swivelling inside corner FF20 2.75m 27mm	255.0	587651000
Gelenkinnenecke FF20 27mm		

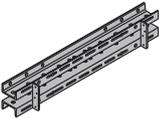
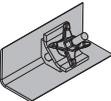
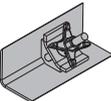
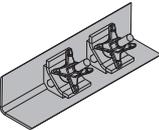
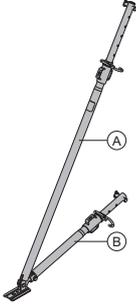
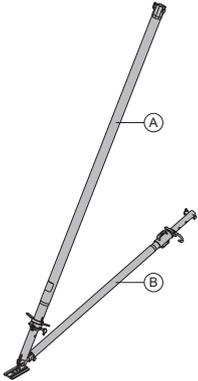


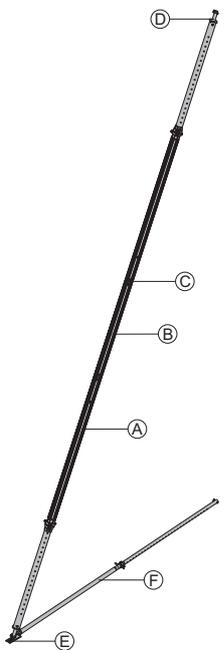
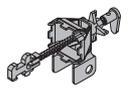
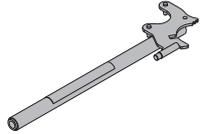
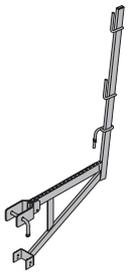
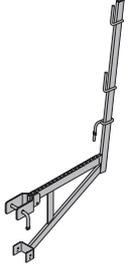
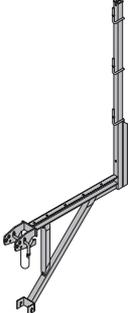
Swivelling outside corner FF20 2.75m 21mm	102.7	587579000
Swivelling outside corner FF20 1.00m 21mm	46.2	587578000
Gelenkaußenecke FF20 21mm		

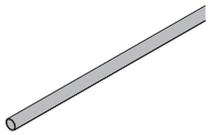
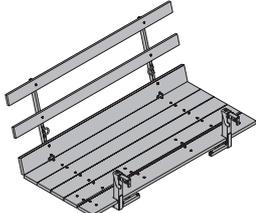
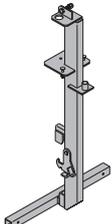
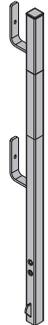
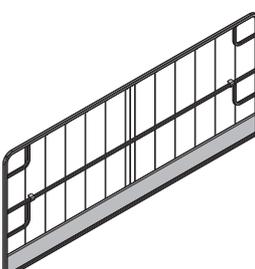
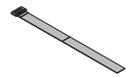
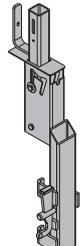
Painted blue

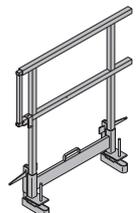
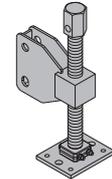


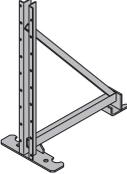
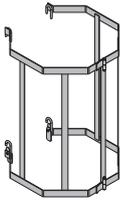
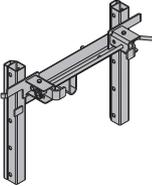
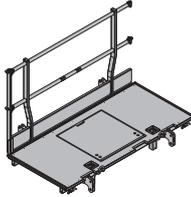
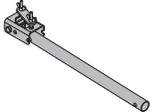
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<b>Swivelling outside corner FF20 2.75m 27mm</b> <b>Swivelling outside corner FF20 1.00m 27mm</b> Gelenkaußenecke FF20 27mm Painted blue 	102.7	587654000		6.6	587531000
<b>Anchoring plate FF20/50</b> Ankerungslasche FF20/50 Painted blue Length: 55 cm 	46.2	587653000			
<b>Splice plate with join adjustment</b> Verbindungslasche mit Fugenjustierung Painted blue Length: 76 cm 	16.1	587652000		13.8	580215000
<b>Swivelling outside corner FF20 0.50m</b> Gelenkaußenecke FF20 0,50m Painted blue 	7.2	587571000		1.7	580216000
<b>Corner plate FF20 G</b> Ecklasche FF20 G Painted blue Length: 49 cm Width: 24 cm 	0.30	587545000			
<b>Fastening bolt FF20</b> Spannbolzen FF20 Galvanised Length: 17 cm Width-across: 30 mm 	0.43	587544000		6.2	587534000
<b>Star grip nut 15.0 G</b> Sternmutter 15,0 G Galvanised Width: 10 cm Height: 5 cm Width-across: 26 mm 	18.6	587535000			
<b>Formwork element connector FF20/50</b> Elementverbinder FF20/50 Painted blue Length: 55 cm 	6.3	587530000		4.4	580604000
<b>Formwork element connector FF20/50 Z</b> Elementverbinder FF20/50 Z Painted blue Length: 55 cm 	6.0	587533000			
<b>Adjustable waling extension FF20/50</b> Ausgleichslasche FF20/50 Painted blue Length: 87 cm 	9.1	587532000		0.34	580201000
<b>Beam clamp Top50</b> Trägerklammer Top50 Painted blue Height: 15 cm 	0.34	580201000			
<b>Connecting pin 10cm</b> Verbindungsbolzen 10cm Galvanised Length: 14 cm 	0.03	580204000			
<b>Spring cotter 5mm</b> Federvorstecker 5mm Galvanised Length: 13 cm 	1.0	580135000			
<b>Flange clamp H20</b> Flanschklammer H20 Galvanised Width: 13 cm Width-across: 19 mm 					

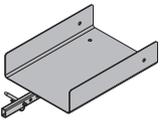
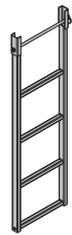
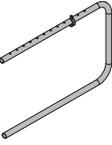
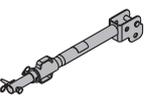
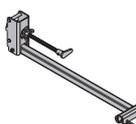
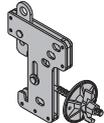
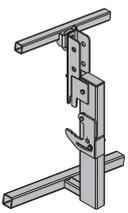
	[kg]	Article N°		[kg]	Article N°
<b>Stacking angle FF20</b> Aufstockwinkel FF20  Painted blue Height: 46 cm	7.8	587547000			
<b>Multi-purpose waling WS10 Top50 0.50m</b> Multi-purpose waling WS10 Top50 0.75m Multi-purpose waling WS10 Top50 1.00m Multi-purpose waling WS10 Top50 1.25m Multi-purpose waling WS10 Top50 1.50m Multi-purpose waling WS10 Top50 1.75m Multi-purpose waling WS10 Top50 2.00m Multi-purpose waling WS10 Top50 2.25m Multi-purpose waling WS10 Top50 2.50m Multi-purpose waling WS10 Top50 2.75m Multi-purpose waling WS10 Top50 3.00m Multi-purpose waling WS10 Top50 3.50m Multi-purpose waling WS10 Top50 4.00m Multi-purpose waling WS10 Top50 4.50m Multi-purpose waling WS10 Top50 5.00m Multi-purpose waling WS10 Top50 5.50m Multi-purpose waling WS10 Top50 6.00m Mehrzweckriegel WS10 Top50  Painted blue	10.2 14.9 19.6 24.7 29.7 35.0 38.9 44.2 48.7 54.2 60.2 68.4 79.4 89.1 102.0 112.4 118.0	580001000 580002000 580003000 580004000 580005000 580006000 580007000 580008000 580009000 580010000 580011000 580012000 580013000 580014000 580015000 580016000 580017000			
<b>Box-out clamp 24cm</b> <b>Box-out clamp 25cm</b> <b>Box-out clamp 30cm</b> Aussparungsklemme  Galvanised Leg length: 10 cm	3.4 3.4 3.9	580063000 580064000 580065000			
<b>Box-out clamp type 1 .....cm</b> Aussparungsklemme Typ 1 .....cm  Painted blue Leg length: 10 cm	17.4	580066000			
<b>Box-out clamp type 2 .....cm</b> Aussparungsklemme Typ 2 .....cm  Painted blue Leg length: 10 cm	17.4	580067000			
<b>Wall-formwork support angle</b> Auflagewinkel Wandschalung  Galvanised Length: 15.8 cm Width: 12 cm Height: 28 cm	6.6	588967000			
<b>Panel strut 340 IB</b> Elementstütze 340 IB consisting of: (A) <b>Plumbing strut 340 IB</b> Galvanised Length: 190.8 - 341.8 cm (B) <b>Adjusting strut 120 IB</b> Galvanised Length: 81.5 - 130.6 cm Galvanised Delivery condition: folded closed 	24.3 16.7 7.6	580365000 588696000 588248500			
<b>Panel strut 540 IB</b> Elementstütze 540 IB consisting of: (A) <b>Plumbing strut 540 IB</b> Galvanised Length: 310.5 - 549.2 cm (B) <b>Adjusting strut 220 IB</b> Galvanised Length: 172.5 - 221.1 cm Galvanised Delivery condition: folded closed 	41.4 30.7 10.9	580366000 588697000 588251500			

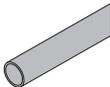
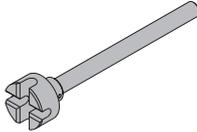
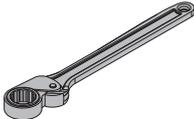
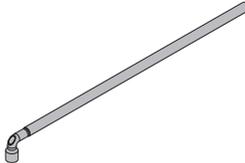
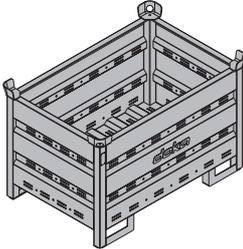
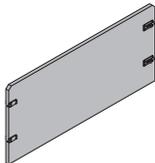
	[kg]	Article N°		[kg]	Article N°
<b>Eurex 60 550</b>					
Eurex 60 550					
depending on length, comprising:					
(A) <b>Plumbing strut Eurex 60 550</b>	42.5	582658000			
Powder-coated blue					
Aluminium					
Length: 343 - 553 cm					
(B) <b>Extension Eurex 60 2.00m</b>	21.3	582651000			
Powder-coated blue					
Aluminium					
Length: 250 cm					
(C) <b>Coupler Eurex 60</b>	8.6	582652000			
Aluminium					
Length: 100 cm					
Diameter: 12.8 cm					
(D) <b>Connector Eurex 60 IB</b>	4.2	582657500			
Galvanised					
Length: 15 cm					
Width: 15 cm					
Height: 30 cm					
(E) <b>Plumbing strut shoe Eurex 60 EB</b>	8.0	582660500			
Galvanised					
Length: 31 cm					
Width: 12 cm					
Height: 33 cm					
(F) <b>Adjusting strut 540 Eurex 60 IB</b>	27.8	582659500			
Galvanised					
Length: 303.5 - 542.2 cm					
Delivery condition: separate parts					
					
<b>Prop head EB</b>					
Stützenkopf EB					
			Galvanised		
			Length: 40.8 cm		
			Width: 11.8 cm		
			Height: 17.6 cm		
<b>Universal dismantling tool</b>					
Universal-Lösewerkzeug					
			Galvanised		
			Length: 75.5 cm		
<b>Doka express anchor 16x125mm</b>					
Doka-Expressanker 16x125mm					
			Galvanised		
			Length: 18 cm		
			Follow the directions in the "Fitting instructions"!		
<b>Doka coil 16mm</b>					
Doka-Coil 16mm					
			Galvanised		
			Diameter: 1.6 cm		
<b>Top scaffold bracket L</b>					
Betonierkonsole L					
			Galvanised		
			Length: 101 cm		
			Height: 159 cm		
<b>Top scaffold bracket L painted</b>					
Betonierkonsole L lackiert					
			Painted blue		
			Length: 101 cm		
			Height: 159 cm		
<b>Universal bracket 60</b>					
Universal-Konsole 60					
			Galvanised		
			Length: 86 cm		
			Height: 181 cm		
<b>Universal bracket 90</b>					
Universal-Konsole 90					
			Galvanised		
			Length: 121 cm		
			Height: 235 cm		
<b>Universal railing shackle</b>					
Universal-Geländerbügel					
			Galvanised		
			Height: 20 cm		

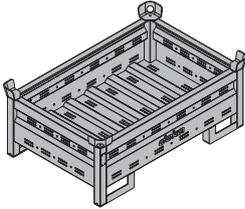
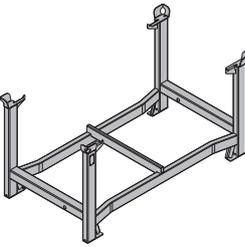
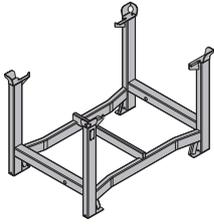
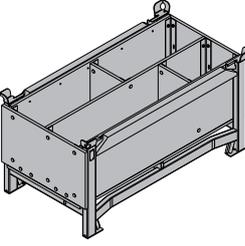
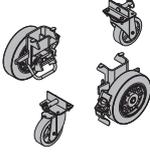
	[kg]	Article N°		[kg]	Article N°
<b>Scaffold tube 48.3mm 0.50m</b> <b>Scaffold tube 48.3mm 1.00m</b> <b>Scaffold tube 48.3mm 1.50m</b> <b>Scaffold tube 48.3mm 2.00m</b> <b>Scaffold tube 48.3mm 2.50m</b> <b>Scaffold tube 48.3mm 3.00m</b> <b>Scaffold tube 48.3mm 3.50m</b> <b>Scaffold tube 48.3mm 4.00m</b> <b>Scaffold tube 48.3mm 4.50m</b> <b>Scaffold tube 48.3mm 5.00m</b> <b>Scaffold tube 48.3mm 5.50m</b> <b>Scaffold tube 48.3mm 6.00m</b> <b>Scaffold tube 48.3mm .....m</b> Gerüstrohr 48,3mm	1.7 3.6 5.4 7.2 9.0 10.8 12.6 14.4 16.2 18.0 19.8 21.6 3.6	682026000 682014000 682015000 682016000 682017000 682018000 682019000 682021000 682022000 682023000 682024000 682025000 682001000	 Galvanised		
<b>Scaffold tube connection</b> Gerüstrohranschluss	0.27	584375000	 Galvanised Height: 7 cm		
<b>Screw-on coupler 48mm 50</b> Anschraubkupplung 48mm 50	0.84	682002000	 Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!		
<b>Framax pouring platform U 1.25/2.70m</b> Framax-Betonierbühne U 1,25/2,70m	127.5	588377000	 Steel parts galvanised Timber parts varnished yellow Delivery condition: folded closed		
<b>FF20 adapter for Framax pouring platform U</b> FF20-Adapter für Framax-Betonierbühne U	6.8	588381000	 Galvanised Length: 34 cm		
<b>Top50 adapter for Framax pouring platform U</b> Top50-Adapter für Framax-Betonierbühne U	18.5	588384000	 Galvanised Width: 75 cm Height: 134 cm		
<b>Handrail post XP 1.20m</b> Geländersteher XP 1,20m	4.1	586460000	 Galvanised Height: 118 cm		
<b>Toeboard holder XP 1.20m</b> Fußwehrhalter XP 1,20m	0.64	586461000	 Galvanised Height: 21 cm		
<b>Railing clamp XP 40cm</b> Geländerzwinge XP 40cm	7.7	586456000	 Galvanised Height: 73 cm		
<b>Protective grating XP 2.70x1.20m</b> <b>Protective grating XP 2.50x1.20m</b> <b>Protective grating XP 2.00x1.20m</b> <b>Protective grating XP 1.20x1.20m</b> Schutzgitter XP	22.2 20.5 17.4 12.0	586450000 586451000 586452000 586453000	 Galvanised		
<b>Velcro fastener 30x380mm</b> Klettverschluss 30x380mm	0.02	586470000	 Yellow		
<b>Timber-beam formwork adapter XP</b> Trägerschalungsadapter XP	9.5	586476000	 Galvanised Height: 83.5 cm		

		[kg]	Article N°			[kg]	Article N°
<b>Handrail clamp S</b> Schutzgeländerzwinge S 	Galvanised Height: 123 - 171 cm	11.5	580470000	<b>Handrail post T 1.80m</b> Einschubgeländer T 1,80m 	Galvanised	17.7	584373000
<b>Handrail clamp T</b> Schutzgeländerzwinge T 	Galvanised Height: 122 - 155 cm	12.3	584381000	<b>Toeboard holder T 1.80m</b> Fußwehrhalter T 1,80m 	Galvanised Height: 13.5 cm	0.53	584392000
<b>Handrail post 1.10m</b> Schutzgeländer 1,10m 	Galvanised Height: 134 cm	5.5	584384000	<b>Doka 4-part chain 3.20m</b> Doka-Vierstrangkette 3,20m 	Follow the directions in the "Operating Instructions"!	15.0	588620000
<b>Attachable sleeve 24mm</b> Steckhülse 24mm 	PVC PE Grey Length: 16.5 cm Diameter: 2.7 cm	0.03	584385000	<b>Lifting chain 100cm 15kN</b> Anschlagkette 100cm 15kN 	Length: 103 cm Follow the directions in the "Operating Instructions"!	1.8	587548000
<b>Screw sleeve 20.0</b> Schraubhülse 20,0 	PP Yellow Length: 20 cm Diameter: 3.1 cm	0.03	584386000	<b>Dokamatic lifting strap 13.00m</b> Dokamatic-Umsetzgurt 13,00m 	Green Follow the directions in the "Operating Instructions"!	10.5	586231000
<b>Side handrail clamping unit T</b> Seitenschutzgeländer T 	Galvanised Length: 115 - 175 cm Height: 112 cm	29.1	580488000	<b>Lifting bracket</b> Kranöse 	Galvanised Height: 59 cm	6.2	580460000
				<b>Height adjuster WS10-WU16</b> Höhenjustierung WS10-WU16 	Galvanised Height: 45 cm	10.1	580206500

	[kg]	Article N°		[kg]	Article N°
<b>Supporting construction</b> Abstützwinkel  <p>Galvanised                      Length: 66 cm                      Width: 37 cm                      Height: 91 cm</p>	10.7	588477000	<b>Ladder cage XS 1.00m</b> <b>Ladder cage XS 0.25m</b> Rückenschutz XS  <p>Galvanised</p>	16.5 10.5	588643000 588670000
<b>Ladder system XS</b>					
<b>Connector XS Wall formwork</b> Anschluss XS Wandschalung  <p>Galvanised                      Width: 89 cm                      Height: 63 cm</p>	20.8	588662000	<b>Ladder cage exit XS</b> Rückenschutz-Ausstieg XS  <p>Galvanised                      Height: 132 cm</p>	17.0	588666000
<b>System ladder XS 4.40m</b> System-Leiter XS 4,40m  <p>Galvanised</p>	33.2	588640000	<b>Platform system Xsafe plus</b>		
			<b>Xsafe plus platform 2.00m</b> Xsafe plus-Bühne 2,00m  <p>Steel parts galvanised                      Timber parts varnished yellow                      Height: 136 cm                      Delivery condition: folded closed</p>	122.5	586407000
			<b>Xsafe plus platform 1.00m</b> Xsafe plus-Bühne 1,00m  <p>Steel parts galvanised                      Timber parts varnished yellow                      Height: 136 cm                      Delivery condition: folded closed</p>	78.5	586409000
<b>Ladder extension XS 2.30m</b> Leiternverlängerung XS 2,30m  <p>Galvanised</p>	19.1	588641000	<b>Xsafe plus side railing</b> Xsafe plus-Seitengeländer  <p>Galvanised                      Width: 88 cm                      Height: 110 cm</p>	20.5	586410000
<b>Securing barrier XS</b> Sicherungsschranke XS  <p>Galvanised                      Length: 80 cm</p>	4.9	588669000	<b>Xsafe plus railing-closure post</b> Xsafe plus-Geländerausgleich  <p>Galvanised                      Height: 111 cm</p>	3.4	586411000

	[kg]	Article N°		[kg]	Article N°
<b>Xsafe plus platform extension 0.60m</b> Xsafe plus-Bühnenverlängerung 0,60m  Galvanised Height: 120 cm Delivery condition: railing included	43.4	586418000	<b>Xsafe plus telescopic ladder</b> Xsafe plus-Teleskopleiter  Galvanised Height: 158 - 274 cm	15.0	586421000
<b>Xsafe plus platform transition</b> Xsafe plus-Bühnenübergang  Galvanised Length: 85 cm Width: 48 cm	26.5	586419000	<b>Xsafe plus ladder extension 1.15m</b> Xsafe plus-Leiternverlängerung 1,15m  Galvanised Height: 126 cm	7.0	586422000
<b>Xsafe plus handrail extension</b> Xsafe plus-Geländerverlängerung  Galvanised Length: 81 cm Width: 53 cm	4.3	586420000	<b>Xsafe plus counter railing 2.00m</b> <b>Xsafe plus counter railing 1.00m</b> Xsafe plus-Gegengeländer  Galvanised Height: 200 cm Delivery condition: folded closed	20.3 15.5	586428000 586430000
<b>Xsafe plus supporting strut EB</b> Xsafe plus-Stützenstrebe EB  Galvanised Length: 91 - 99 cm	8.0	586412500	<b>Xsafe plus ladder starter piece</b> Xsafe plus-Leiternhalter  Galvanised Length: 95 cm	2.1	586423000
<b>Xsafe plus waling connector</b> Xsafe plus-Riegelverbinder  Galvanised Height: 33 cm	6.1	586433000	<b>Xsafe plus lifting adapter for beam formwork</b> Xsafe plus-Umsetzadapter Trägerschalung  Galvanised Width: 66 cm Height: 89 cm	14.0	586439000

	[kg]	Article N°		[kg]	Article N°
<b>Tie rod system 15.0</b>					
Tie rod 15.0mm galvanised 0.50m	0.72	581821000			
Tie rod 15.0mm galvanised 0.75m	1.1	581822000			
Tie rod 15.0mm galvanised 1.00m	1.4	581823000			
Tie rod 15.0mm galvanised 1.25m	1.8	581826000			
Tie rod 15.0mm galvanised 1.50m	2.2	581827000			
Tie rod 15.0mm galvanised 1.75m	2.5	581828000			
Tie rod 15.0mm galvanised 2.00m	2.9	581829000			
Tie rod 15.0mm galvanised 2.50m	3.6	581852000			
Tie rod 15.0mm galvanised .....m	1.4	581824000			
Tie rod 15.0mm non-treated 0.50m	0.73	581870000			
Tie rod 15.0mm non-treated 0.75m	1.1	581871000			
Tie rod 15.0mm non-treated 1.00m	1.4	581874000			
Tie rod 15.0mm non-treated 1.25m	1.8	581886000			
Tie rod 15.0mm non-treated 1.50m	2.1	581876000			
Tie rod 15.0mm non-treated 1.75m	2.5	581887000			
Tie rod 15.0mm non-treated 2.00m	2.9	581875000			
Tie rod 15.0mm non-treated 2.50m	3.6	581877000			
Tie rod 15.0mm non-treated 3.00m	4.3	581878000			
Tie rod 15.0mm non-treated 3.50m	5.0	581888000			
Tie rod 15.0mm non-treated 4.00m	5.7	581879000			
Tie rod 15.0mm non-treated 5.00m	7.2	581880000			
Tie rod 15.0mm non-treated 6.00m	8.6	581881000			
Tie rod 15.0mm non-treated 7.50m	10.7	581882000			
Tie rod 15.0mm non-treated .....m	1.4	581873000			
Ankerstab 15,0mm					
			<b>DIN</b> 18216		
<b>Wing nut 15.0</b> Flügelmutter 15,0	0.31	581961000		Galvanised Length: 10 cm Height: 5 cm Width-across: 27 mm	<b>DIN</b> 18216
<b>Super plate 15.0</b> Superplatte 15,0	1.1	581966000		Galvanised Height: 6 cm Diameter: 12 cm Width-across: 27 mm	<b>DIN</b> 18216
<b>Plastic tube 22mm 2.50m</b> Kunststoffrohr 22mm 2,50m	0.45	581951000		PVC Grey Diameter: 2.6 cm	
<b>Universal cone 22mm</b> Universal-Konus 22mm	0.005	581995000		Grey Diameter: 4 cm	
<b>Plug 22mm</b> Verschlussstopfen 22mm	0.003	581953000		PE Grey	
<b>Distance piece 20cm</b> <b>Distance piece 25cm</b> <b>Distance piece 30cm</b> Distanzhalter	0.04 0.05 0.06	581907000 581908000 581909000		PE Grey Blue	
<b>Protective cap 15.0/20.0</b> Schutzkappe 15,0/20,0	0.03	581858000		Yellow Length: 6 cm Diameter: 6.7 cm	
<b>Tie-rod wrench 15.0/20.0</b> Ankerstabschlüssel 15,0/20,0	1.8	580594000		Galvanised	
<b>Friction type ratchet SW27</b> Freilaufknarre SW27	0.49	581855000		Manganese-phosphated Length: 30 cm	
<b>Box spanner 27 0.65m</b> Steckschlüssel 27 0,65m	1.9	581854000		Galvanised	
<b>Multi-trip packaging</b>					
<b>Doka skeleton transport box 1.70x0.80m</b> Doka-Gitterbox 1,70x0,80m	87.0	583012000		Galvanised Height: 113 cm	
<b>Doka multi-trip transport box 1.20x0.80m</b> Doka-Mehrwegcontainer 1,20x0,80m	70.0	583011000		Galvanised Height: 78 cm	
<b>Multi-trip transport box partition 0.80m</b> <b>Multi-trip transport box partition 1.20m</b> Mehrwegcontainer Unterteilung	3.7 5.5	583018000 583017000		Steel parts galvanised Timber parts varnished yellow	

	[kg]	Article N°	[kg]	Article N°
<p><b>Doka multi-trip transport box 1.20x0.80x0.41m</b>                      Doka-Mehrwegcontainer 1,20x0,80x0,41m                      Galvanised</p> 	42.5	583009000		
<p><b>Doka stacking pallet 1.55x0.85m</b>                      Doka-Stapelpalette 1,55x0,85m                      Galvanised                      Height: 77 cm</p> 	41.0	586151000		
<p><b>Doka stacking pallet 1.20x0.80m</b>                      Doka-Stapelpalette 1,20x0,80m                      Galvanised                      Height: 77 cm</p> 	38.0	583016000		
<p><b>Doka accessory box</b>                      Doka-Kleinteilebox                      Timber parts varnished yellow                      Steel parts galvanised                      Length: 154 cm                      Width: 83 cm                      Height: 77 cm</p> 	106.4	583010000		
<p><b>Bolt-on castor set B</b>                      Anklemm-Radsatz B                      Painted blue</p> 	33.6	586168000		

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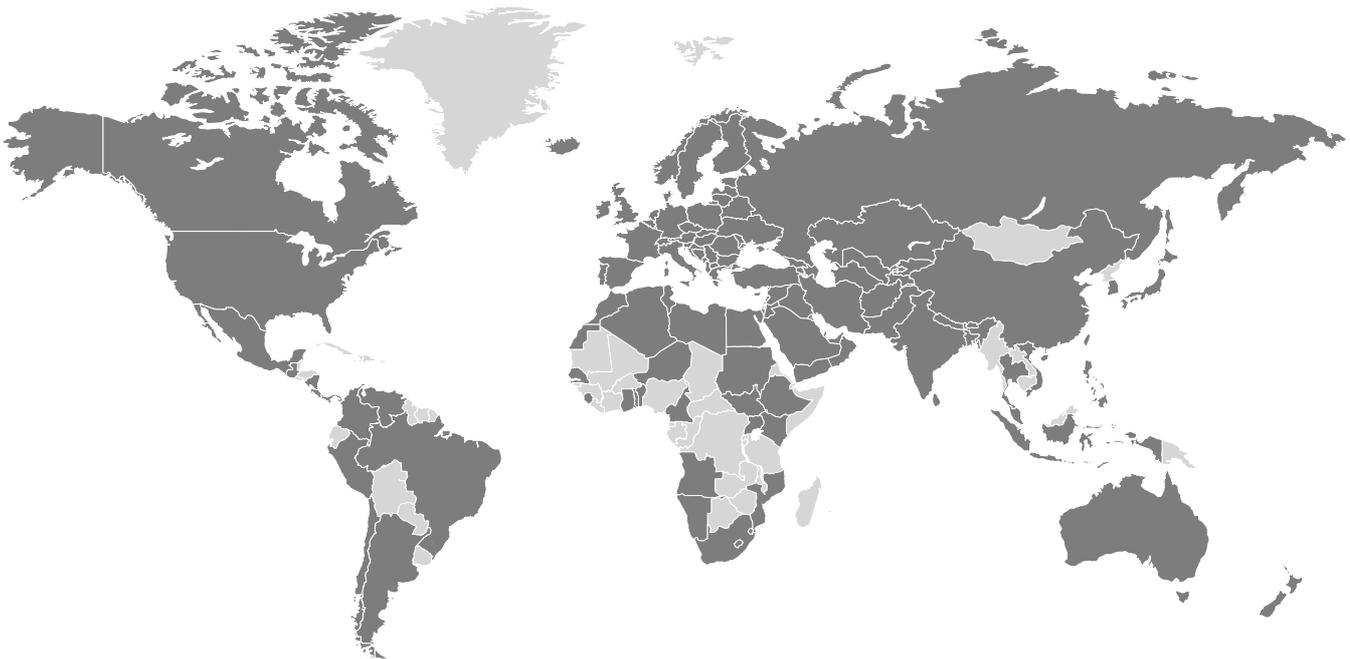
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