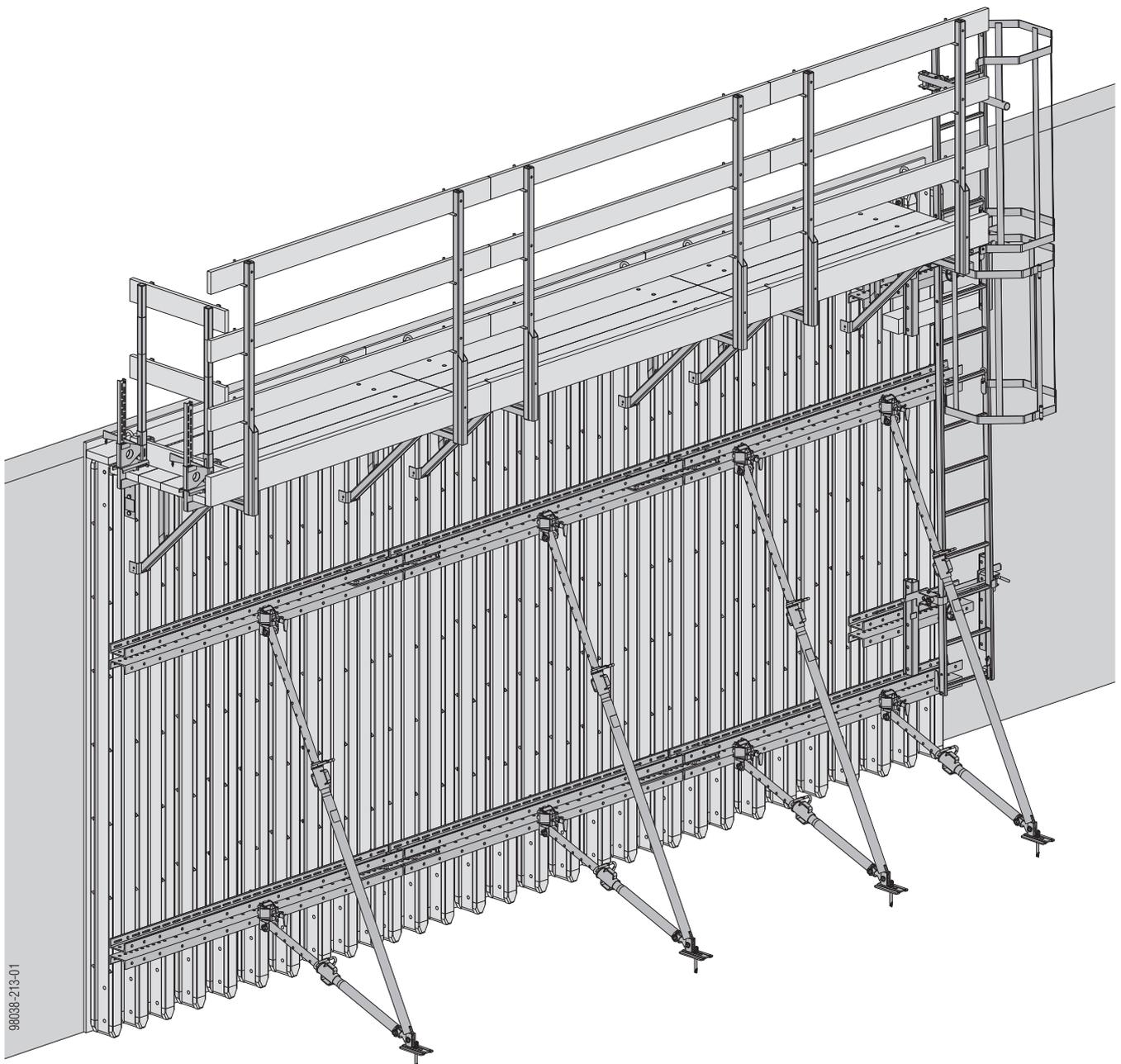


The Formwork Experts.

Large-area formwork Top 100 tec

User Information

Instructions for assembly and use (Method statement)



99038-213-01

Contents

4	Introduction	74	Element assembly
4	Elementary safety warnings	82	Structural design
7	Services	82	Top100 tec waling WU14
8	Product description	83	Doka beam I tec 20
10	Wall formwork	84	Doka formwork sheets
10	Instructions for assembly and use (Method statement)	88	Top100 tec elements
13	Flexibility	90	Struts
14	Top 100 element in detail	91	General
16	Tie rod system	91	Fall-arrest systems on the structure
18	Inter-panel connections	92	Doka multi-trip packaging
20	Length adjustment using closures	96	Cleaning and care of your equipment
23	Height adjustment	100	Article list
24	90 degree corners		
30	Stop-end formwork		
31	Window and door openings		
32	Vertical stacking of panels		
33	Shaft formwork		
38	Circular formwork		
39	Plumbing accessories		
42	Pouring platforms with single brackets		
46	Pouring platforms		
49	Opposing guardrail		
52	Wall formwork at the edge of the structure		
54	Ladder system		
58	Lifting by crane		
59	Combining different formwork systems		
60	Enhanced requirements for fair-faced concrete		
63	Wall formwork with Platform system Xsafe plus		
64	Other possible areas of use		
64	Using Top 100 tec as bridge superstructure and tunnel formwork		
68	Extra functions in the Top100 tec waling WU14		
69	Top 100 tec combined with . . .		
72	Utilising self-compacting concrete		

Introduction

Elementary safety warnings

User target groups

- This booklet is aimed at all persons who will be working with the Doka product or system that it describes. It contains information on the standard design for setting up this system, and on correct, compliant 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

- 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

- 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

- 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. $F_{perm} = 70 \text{ kN}$) are not design values (e.g. $F_{Rd} = 105 \text{ kN}$)!

- 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:

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

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.

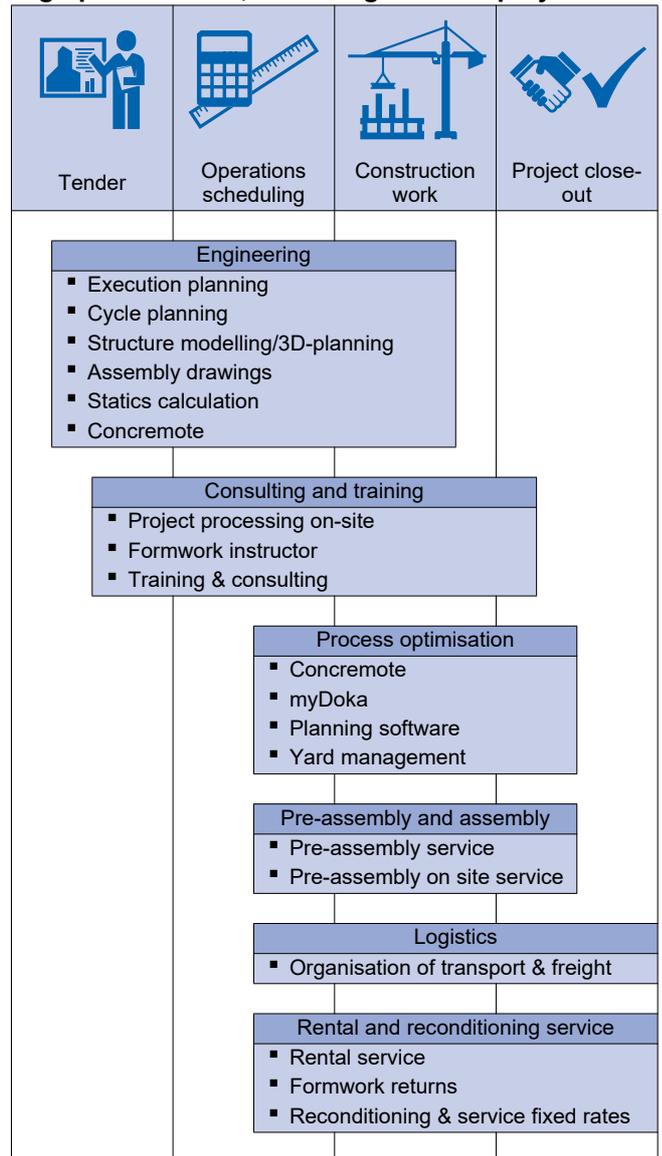
Just-in-time availability

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.

Product description

Large-area formwork Top 100 tec - the super-strong timber-beam formwork for any requirement

Saves on time-consuming ties and connectors

- 1/3 fewer form-ties
- 30% fewer connector components

Cost-saving implementation of architectural specifications

- unlimited form-facing options
- larger form-tie pattern

Superlative concrete finishes

- improved surface planeness, due to the stiffer elements
- form-facing is screwed on from the rear, leaving no screw-head imprints
- optimised formwork-element connectors make for tight element joints

High pouring rates

- heavy-duty I tec 20 beam
- strong Top100 tec waling WU14
- Tie-rod system 20.0

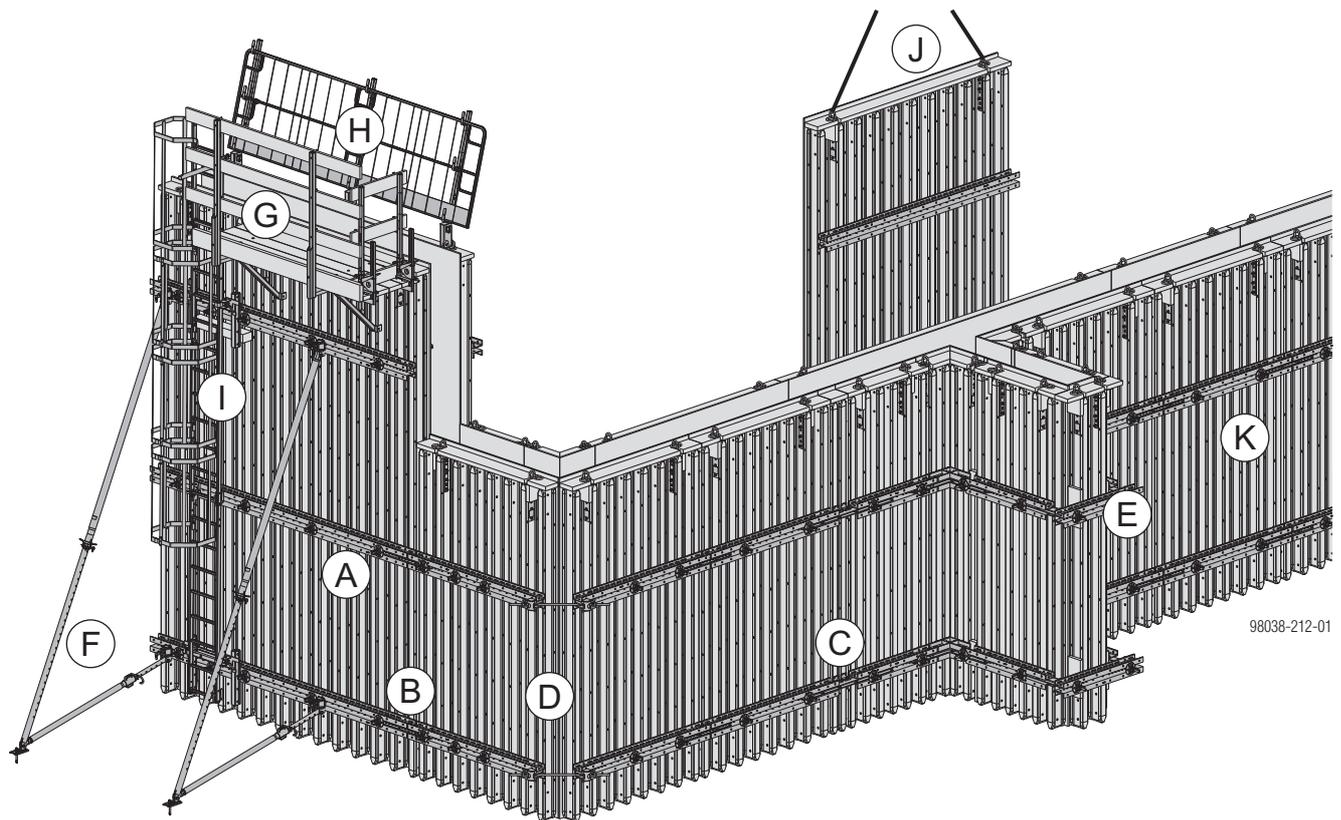
Optimised equipment utilisation on civil-engineering projects

- fewer items of equipment needed, meaning easier assembly, thanks to the wider spacing of the parallel girderframe units on e.g. bridges
- optimised hole-grid in the Top100 tec waling WU14 for more flexibility when fitting connectors

High safety

The accident risk is reduced, and legally compliant working conditions are ensured, by

- the safe ladderways of the Ladder system XS
- combining the formwork with the Platform system Xsafe plus

**Section:**

- A** Tie rod system
- B** Inter-panel connection
- C** Length adjustment using closures
- D** 90 degree corners
- E** Stop-end formwork
- F** Plumbing accessories
- G** Pouring platforms with single brackets
- H** Opposing guardrail
- I** Ladder system
- J** Lifting by crane
- K** Element assembly

Wall formwork

Instructions for assembly and use (Method statement)

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).

Preconditions for use:

Platforms and all accessories must only be mounted to the element when this is face-down on the ground.

It must be possible for all formwork set-up, pouring and stripping operations to be carried out from safe workplaces.

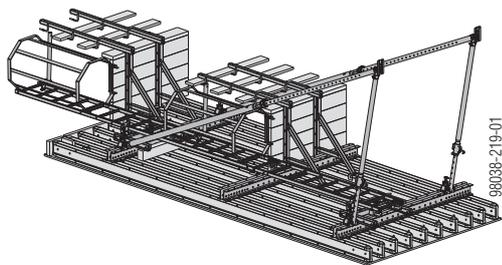
Pre-assembly

- Pre-assemble the elements face-down on an assembly bench (see "Element assembly").



The professionals from the Doka "Ready-to-Use Service" plan and assemble **site-ready and custom formworks** exactly to your specifications.

- Mount the platforms to the face-down element (see "Pouring-platforms with single brackets").
- Mount the ladder system to the face-down element (see "Ladder system").
- Mount panel struts to the face-down element (see "Plumbing accessories").



- A Platform
- B Ladder system
- C Panel strut

Closing the formwork

- Attach the crane lifting tackle to the lifting brackets (see the section headed 'Lifting by crane').

Max. load-bearing capacity:

1300 kg per lifting bracket

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



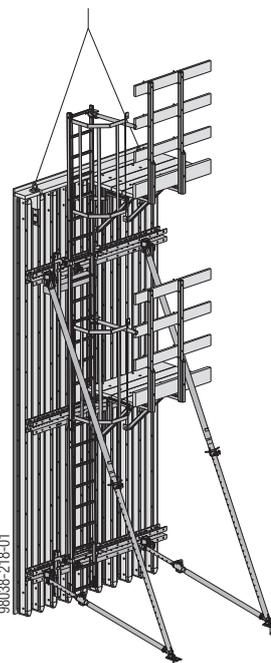
NOTICE

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 board.



The element 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!

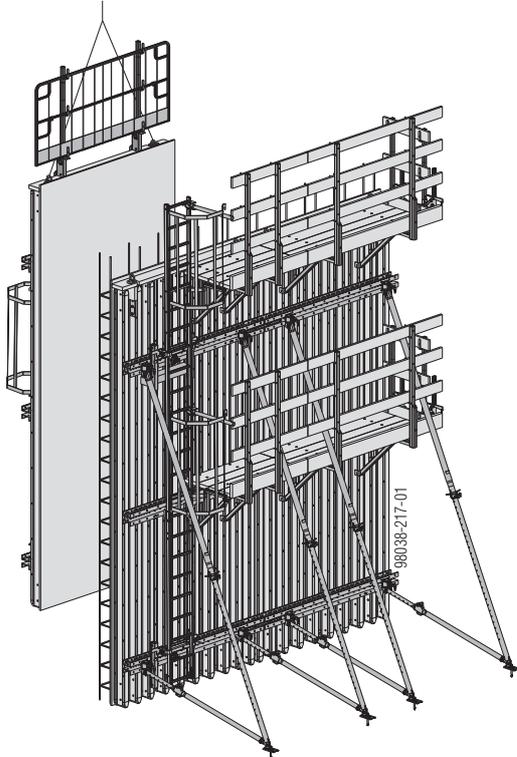
- Either use personal protective equipment to protect against falls (e.g. safety harness) or mount an opposing guardrail to the gang-form while this is still being pre-assembled in a flat position.

- Detach the element from the crane.
- Continue lining up elements 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 personal protective equipment to protect against falls (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 element from the crane.
- ▶ Insert the remaining form ties. These form-tie locations can be reached from the platforms.
- ▶ Continue lining up elements in this way, and link them together (see the section headed 'Inter-panel connections').

Pouring

Permitted fresh-concrete pressure:

will depend on the dimensioning of the elements (see also project plan).

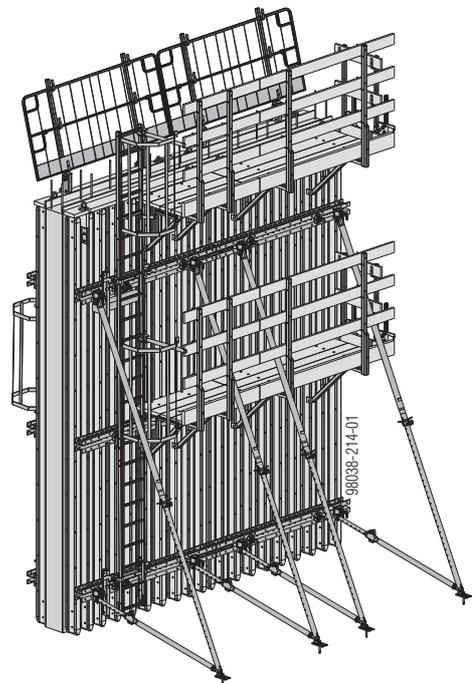
Observe the following **guidelines**:

- 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.

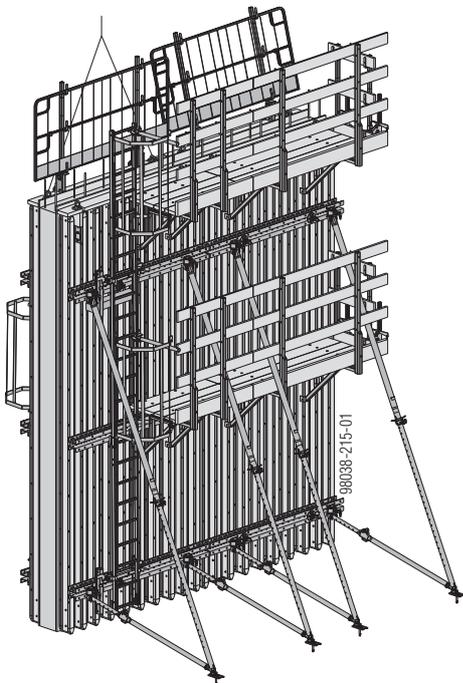
Begin work on stripping the formwork on the opposing formwork:

- ▶ Undo the connectors to the adjacent elements.



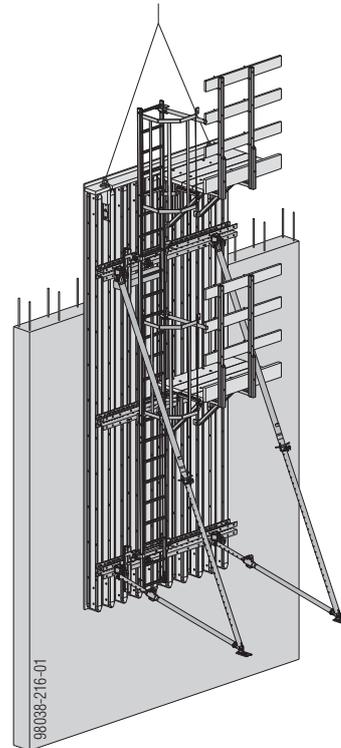
WARNING

- ▶ 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 element (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 personal protective equipment to protect against falls (e.g. safety harness).
- ▶ Where the element has panel struts attached to it, first attach this element to the crane, and only then detach the floor anchorages of the panel struts.



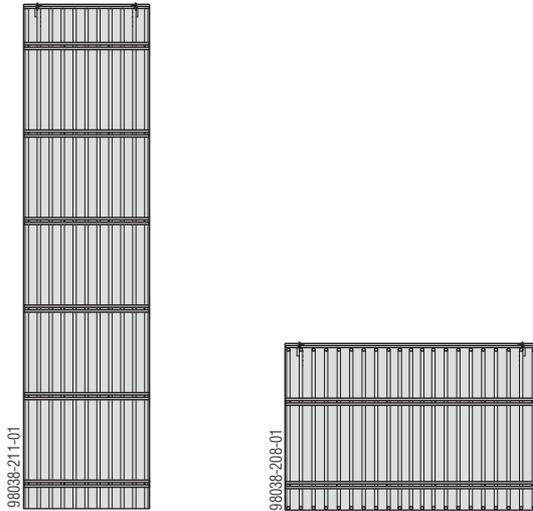
WARNING

- ▶ 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 element away and to its next location, or place it face-down for intermediate storage.
- ▶ Clean residual concrete off the formwork sheet (see the section headed 'Cleaning and care of your equipment').

Flexibility

Size

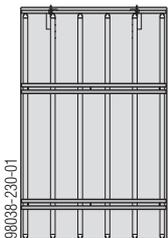
Top100 tec elements can be assembled in **widths of up to 6 m** and in **heights of up to 12 m**.



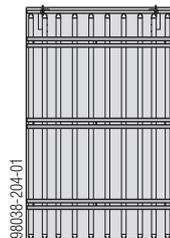
Pressure of fresh concrete

Depending on the **concrete pressure** required, the Doka beams and the walings are spaced closer together or further apart. This ensures optimum formwork design and the greatest economy of materials. For more information on dimensioning Top100 tec elements, see the section headed 'Structural design'.

e.g. fresh-concrete pressure
40 kN/m²



e.g. fresh-concrete pressure
90 kN/m²



Surface

Any type of form-ply can be used, as required:

- Doka formwork sheets 3-SO
- Dokaplex formwork sheets
- Xlife sheets
- Xface sheets
- Tongue-and-groove board formwork etc.

The tie-hole pattern and the element size-grid are easily adapted to suit architectural demands. The large-area elements and exact joins deliver perfect joint patterns.

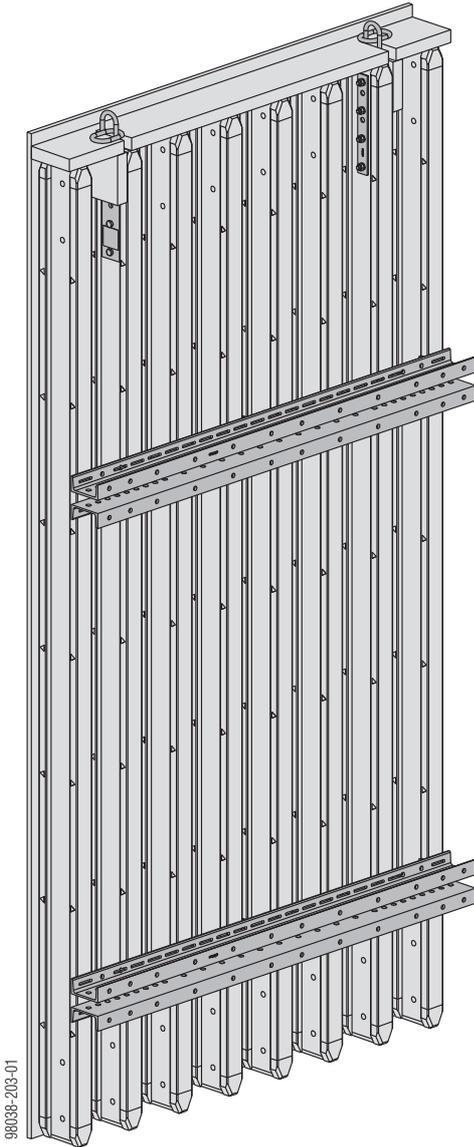


Shape

Creating complex concrete shapes demands a high degree of formwork flexibility. On Large-area formwork Top 100 tec, this is achieved by the use of profiled timber formers.



Top 100 element in detail



Form-facing

- No restrictions on what form-ply you choose - e.g. for smooth fair-faced concrete, wood-textured surfaces, repetitive re-use etc.
- The sheets are quick and easy to change
- Custom versions possible with profiled timber formers, open formwork and tongue-and-groove formwork



Follow the directions in the "Formwork sheeting" User Information booklet!

Steel walings using Top100 tec walings WU14

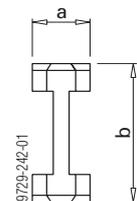
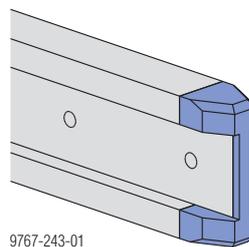
- hold the Doka I tec 20 beams in place and give the element rigidity
- sustain the forces from the form-ties
- make the elements easy to join, using plates and connecting pins

Doka beam I tec 20

- Timber-plastic composite formwork beam with high load capacity
- Long service life, due to plastic sheet on the broad-side of the flange
- Solid-web design; light, dimensionally stable and accurate - for years to come
- DIB (German Institute of Construction Engineering) approval n° Z-9.1-733

Innovative end-reinforcement:

- reduces damage to the ends of the beams
- greatly lengthens the service life



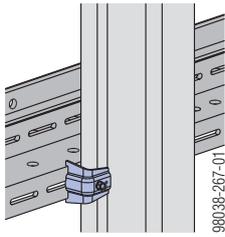
a ... 8 cm
b ... 20 cm



Follow the directions in the "Composite formwork beams" User Information booklet!

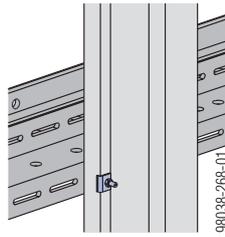
Fastening the beams

Waling clamp H20



- Where more frequent alterations are needed
- Can be mounted anywhere on the waling

Beam screw

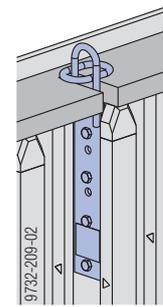


- For bolting the Doka beams directly onto the waling
- Can be mounted anywhere on the waling

See "Element assembly" for alternative ways of fixing the Doka beams.

Crane slinging

by mounting a lifting bracket and a top plank (pressure bracing); see the section headed 'Element assembly'.

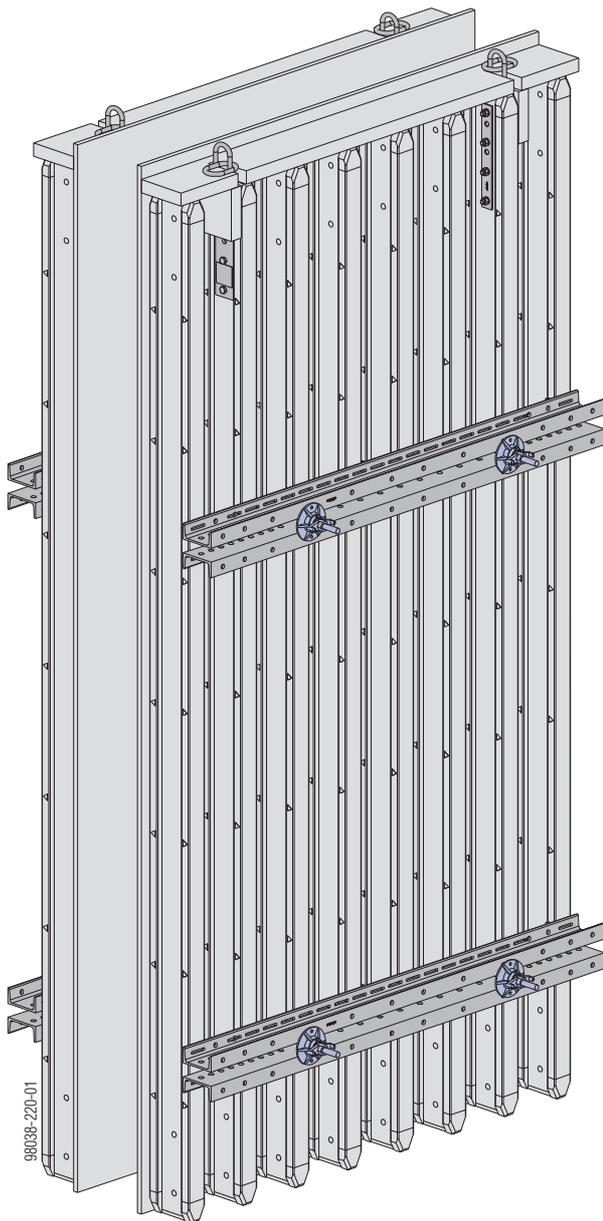


Tie-holes

can be located anywhere along the middle of the waling between the Doka beams



Tie rod system



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.



NOTICE

Allow for elongation of long or coupled tie-rods (see the Calculation Guide 'Doka formwork engineering')!

For correct positioning of the form-ties, see 'Top100 tec elements' and/or the relevant project plan.

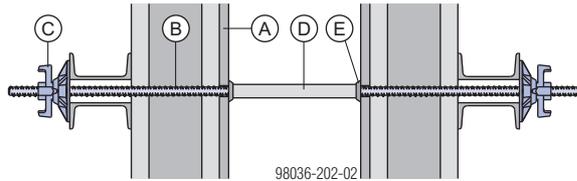
Doka also offers economical solutions for creating watertight wall-ties.



Tie rod wrench 15.0/20.0

For turning and holding the tie rods.

Tie rod system 20.0



- A Top100 tec element
- B Tie rod 20.0mm
- C Super plate 20.0 B
- D Plastic tube 26mm
- E Universal cone 26mm

Tie rod 20.0mm:

Permitted capacity, allowing a 1.6 : 1 factor of safety against failure: 220 kN

Permitted capacity to DIN 18216: 160 kN



NOTICE

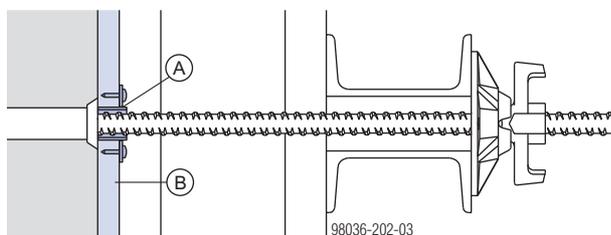
The Plastic tubes 26mm are left in the concrete and are sealed off with **Plugs 26mm**.

Tie-hole protector 20.0

The Tie-hole protector 20.0 protects the form-ply from damage at form-tie points. This is a particular advantage for formwork with high numbers of repeat uses.

Necessary ply thickness: 21 mm

If necessary, the Tie-hole protector 20.0 fitted in the form-ply can be closed off with a Universal plug R20/25.



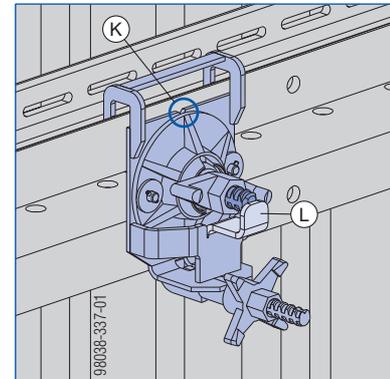
- A Tie-hole protector 20.0
- B Formwork sheet 21mm

Operating the form-tie from one side

The **Top100 tec form-tie nut 20.0** makes it possible to operate the form-tie from one end of the tie (e.g. where space is tight).

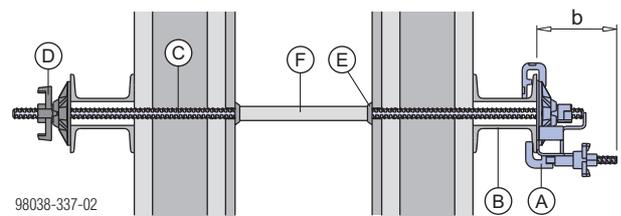
Suitable for U100, U120 and U140 walings with a 50 mm waling-gap.

The form-tie nut has an integrated stopper plate for the tie-rod.



K Notch for aligning the form-tie nut

L Stopper plate for tie-rod



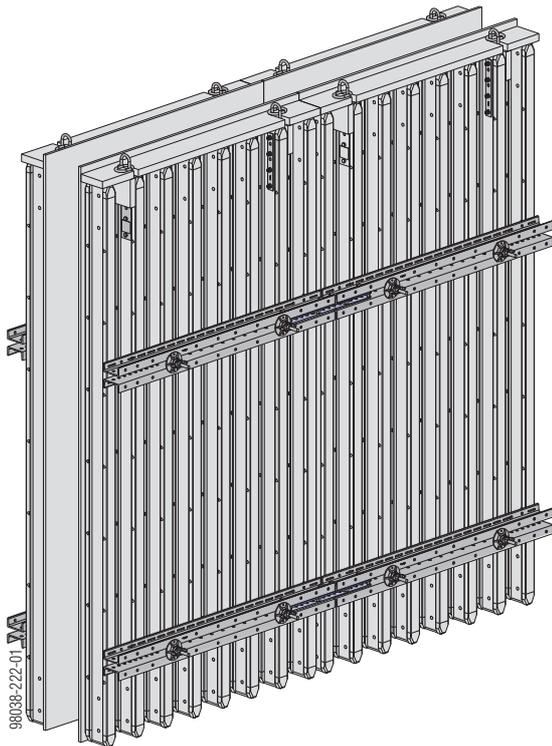
b ... 10 cm

- A Top100 tec form-tie nut 20.0
- B Top100 tec waling WU14
- C Tie rod 20.0mm
- D Super plate 20.0 B
- E Universal cone 26mm
- F Plastic tube 26mm

How to mount:

- Hook the form-tie nut onto the waling and clamp it on firmly with the integrated star-grip nut.
- Screw in the tie-rod of the opposing formwork as far as the stopper plate.
- Fix the form-tie with the super plate.

Inter-panel connections



Top100 tec formwork element connector

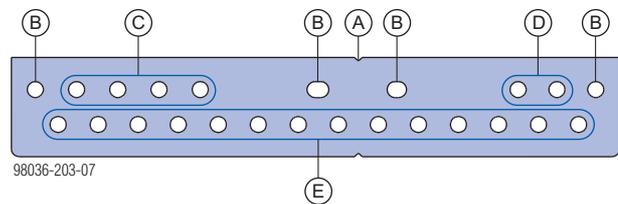
The elements are linked and aligned horizontally using **Top100 tec formwork element connectors** and Connecting pins 10cm:

- fast, tension-proof joints between elements
- Also, the inter-element joint can be pulled tight or pushed apart.
- only tool needed is a hammer

Permitted plastic moment: 11.5 kNm

Permitted plastic shear force: 110 kN

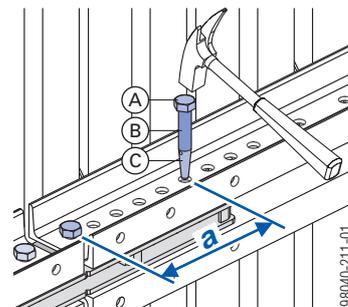
Moment of inertia: 260.0 cm⁴



- A Mark for positioning over element joint
- B Standard holes for Connecting pins 10cm
- C Holes for pull-tight function
- D Holes for push-apart function
- E Holes for filler function

Connecting pin 10cm

The 3 zones of the Connecting pin 10cm:



a ... min. 15 cm (minimum distance between the connecting pins)

- A **Head:** (hammer)
- B **Shank:** (hold)
- C **Cone:** (pull tight)



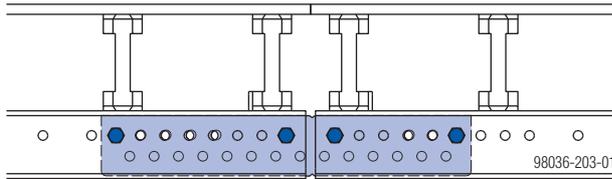
NOTICE

Minimum distance between the connecting pins in the Top100 tec waling: **15 cm**

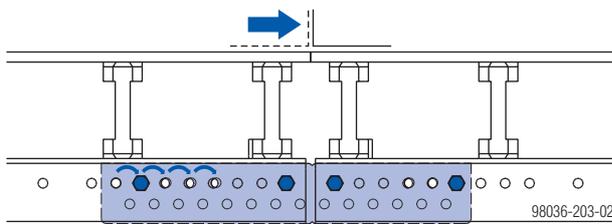
When the connecting pin is used in a horizontal position, secure it with a **Spring cotter 5mm**.

Different ways of fitting the connector

Normal installation situation (zero position)



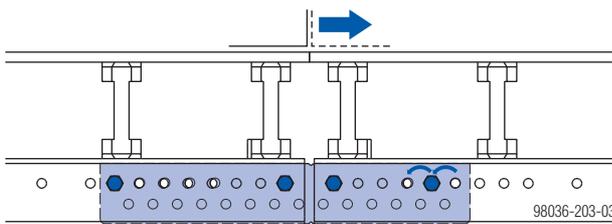
Pull-tight function (max. 6 mm in a 1.5 mm grid)



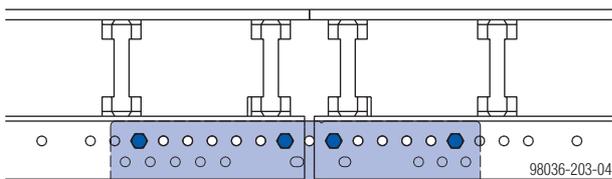
Note:

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

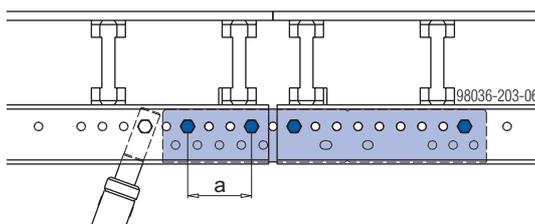
Push-apart function e.g. for inserting a joint-sealing tape (max. 3 mm in a 1.5 mm grid)



Fitted the other way round (rotated about its longitudinal axis) (no pull-tight function)



Formwork element connectors that are fitted "the other way round" can also be relocated to either side if needed.



a ... min. 15 cm (minimum distance between the connecting pins)

Inter-element connections with joint adjustment

The **Top100 tec ply joint adjuster** is used for equalising mismatched joints. This makes it possible to combine elements with different sheet thicknesses (e.g. open formwork).

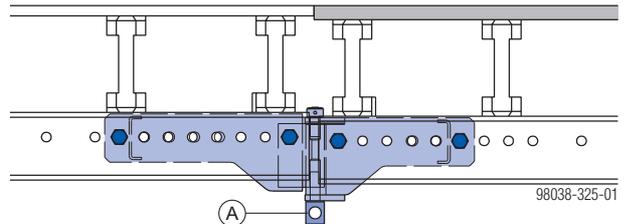
Max. adjustment range: ± 8 mm

Operating tool: tie-rod

Permitted plastic moment: 7.2 kNm

Permitted plastic shear force: 28 kN

Example with different sheet thicknesses:



A Adjusting spindle (with hole for inserting a tie-rod)

Different ways of fitting (as with Top100 tec formwork element connector):

- zero position
- pull-tight function
- push-apart function
- however, no closure function

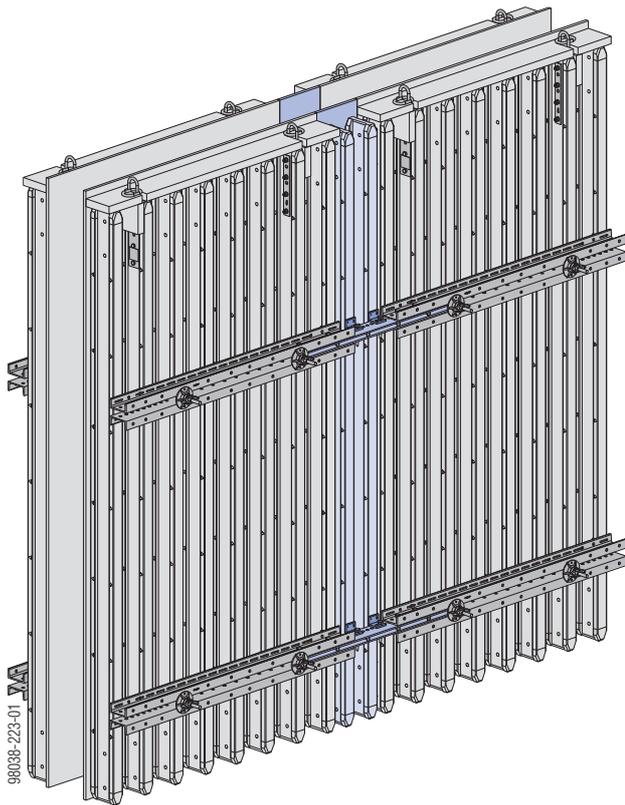


NOTICE

Minimum distance between the connecting pins in the Top100 tec waling: **15 cm**

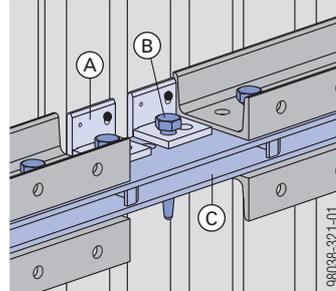
When the connecting pin is used in a horizontal position, secure it with a **Spring cotter 5mm**.

Length adjustment using closures



Fixing the Doka beams in the closure zone

The Doka beams I tec 20 are fixed to the Top100 tec adjustable waling extension or the Top100 tec formwork element connector by Beam clamps Top50. The Beam clamp Top50 is held in place by a Connecting pin 10cm.



- A** Beam clamp Top50
- B** Connecting pin 10cm
- C** Top100 tec adjustable waling extension or Top100 tec formwork element connector

Closures ≤ 75 cm with Top100 tec adjustable waling extension

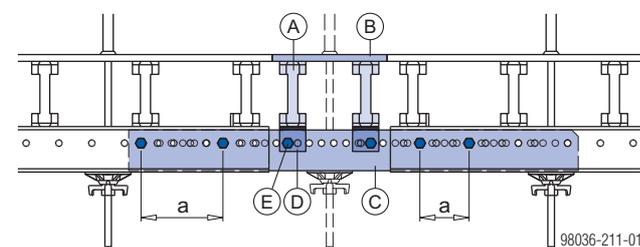
Top100 tec adjustable waling extensions are used for obtaining tension-proof and slippage-free links between Top100 tec elements where **closure gaps of up to 75 cm** need to be bridged.



NOTICE

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

Permitted plastic moment: 11.5 kNm
 Permitted plastic shear force: 110 kN
 Moment of inertia: 260.0 cm⁴



a ... min. 15 cm (minimum distance between the connecting pins)

- A** Doka beam I tec 20
- B** Doka formwork sheeting
- C** Top100 tec adjustable waling extension
- D** Beam clamp Top50
- E** Connecting pin 10cm



NOTICE

Always do a statical check to determine whether an extra form-tie is needed in the closure zone.

The following closure widths [mm] are possible with the Top100 tec adjustable waling extension:

0 to 537.5 mm in a 2.5 mm grid
 542.5 to 575.0 mm

as well as the following:

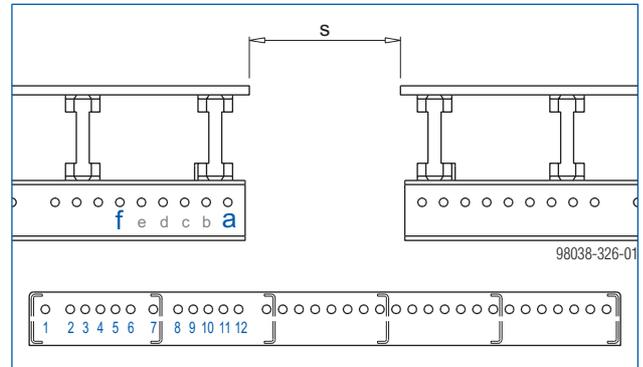
580.0	582.5	585.0	587.5	592.5	595.0	597.5	600.0
602.5	605.0	607.5	612.5	617.5	620.0	622.5	625.0
630.0	632.5	635.0	637.5	642.5	650.0	655.0	657.5
662.5	667.5	670.0	672.5	675.0	687.5	692.5	700.0
705.0	707.5	712.5	725.0	742.5	750.0		

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-hole in waling	
	f	a
X + 0.0	5	11
X + 0.0	1	7
X + 2.5	6	12
X + 5.0	2	8
X + 7.5	3	9
X + 10.0	4	10
X + 12.5	5	11
X + 12.5	1	7
X + 15.0	6	12
X + 17.5	2	8
X + 20.0	3	9
X + 22.5	4	10
X + 25.0	5	11
X + 25.0	1	7
X + 27.5	6	12
X + 30.0	2	8
X + 32.5	3	9
X + 35.0	4	10
X + 37.5	5	11
X + 37.5	1	7
X + 40.0	6	12
X + 42.5	2	8
X + 45.0	3	9
X + 47.5	4	10

Closure s [mm]	Pin-hole in waling	
	f	a
X + 50.0	5	11
X + 50.0	1	7
X + 52.5	6	12
X + 55.0	2	8
X + 57.5	3	9
X + 60.0	4	10
X + 62.5	5	11
X + 62.5	1	7
X + 65.0	6	12
X + 67.5	2	8
X + 70.0	3	9
X + 72.5	4	10
X + 75.0	5	11
X + 75.0	1	7
X + 77.5	6	12
X + 80.0	2	8
X + 82.5	3	9
X + 85.0	4	10
X + 87.5	5	11
X + 87.5	1	7
X + 90.0	6	12
X + 92.5	2	8
X + 95.0	3	9
X + 97.5	4	10

X ... 0, 100, 200, 300, 400, 500, 600 or 700 mm

Example:

- Closure needed: 432.5 mm

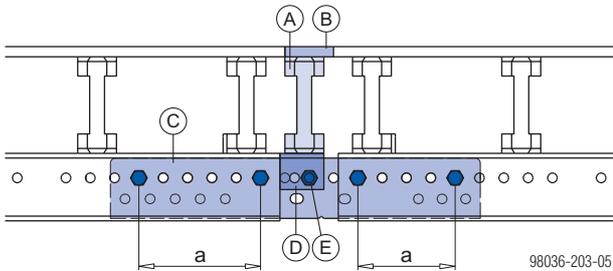
Result:

- pin-holes in waling: 'f' and 'a'
- pin-holes in Adjustable waling extension: '3' and '9'

Closures from 5 to 25 cm using Top100 tec formwork element connector

For **Closures up to 25 cm wide in a 5 cm grid**, it is also possible to use the Top100 tec formwork element connector.

When used on closures, the formwork element connector is fitted the other way round, i.e. **rotated about its longitudinal axis** (no pull-tight function in this case).



98036-203-05

a ... min. 15 cm (minimum distance between the connecting pins)

- A Doka beam I tec 20
- B Doka formwork sheeting
- C Top100 tec formwork element connector
- D Beam clamp Top50
- E Connecting pin 10cm



NOTICE

Always do a static check to determine whether an extra form-tie is needed in the closure zone.

Closures from 3 to 11 cm using Top100 tec adjustable waling extension and joint plate

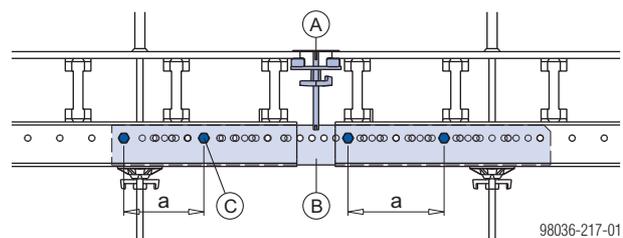
Top100 tec adjustable waling extensions and joint plates can be used to link Top100 tec elements where **closure gaps of between 3 cm and 11 cm** need to be bridged.



To make the formwork easier to strip: Approx. 2 hours after pouring, loosen the joint plate and pull it out a short way by crane.



98038-225-01



98036-217-01

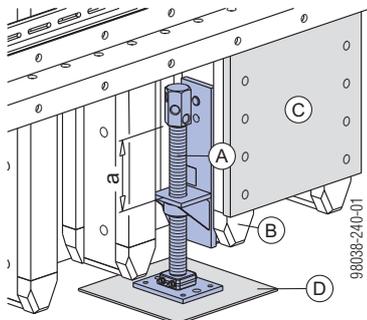
a ... min. 15 cm (minimum distance between connecting pins)

- A Joint plate
- B Top100 tec adjustable waling extension
- C Connecting pin 10cm

Height adjustment

using Height adjuster for formwork beams

The 'Height adjuster for formwork beams' is used for vertical adjustment of **upright** Top100 tec elements, e.g. on shafts.



Adjusting range **a**: max. 24.5 cm

- A** Height adjuster for formwork beams (incl. nuts & bolts etc.)
- B** Doka beam
- C** Stiffening board between 2 adjacent beams (site-provided)
- D** Sliding plate (site-provided)

Max. load: 1000 kg

Ways of operating:

- Box nut 50 3/4" and Reversible ratchet 3/4" (with lengthening-piece if needed)
- Tie-rod 15.0mm or round steel bar (max. diam. 17 mm)

There are holes in the hexagonal nut of the spindle for inserting a tie-rod.



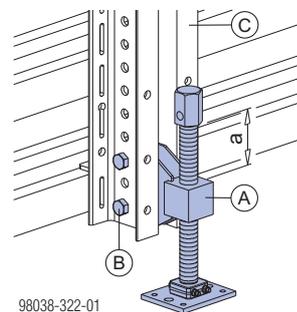
NOTICE

When using the height adjuster on shaft formwork, ensure that the platform decking is adequately dimensioned, as the loads act on the decking in a concentrated manner via the spindles!

Elements can be moved and relocated more easily using sliding plates.

using Height adjuster WS10-WU16

The Height adjuster WS10-WU16 is used for vertical adjustment of timber-beam formwork elements used **in the horizontal**.



Adjusting range **a**: max. 24.5 cm

- A** Height adjuster WS10-WU16
- B** Connecting pin 10cm and Spring cotter 5mm
- C** Top100 tec waling WU14

Max. load: 3000 kg

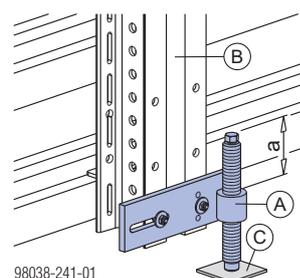
Ways of operating:

- Box nut 50 3/4" and Reversible ratchet 3/4" (with lengthening-piece if needed)
- Tie-rod 15.0mm or round steel bar (max. diam. 17 mm)

There are holes in the hexagonal nut of the spindle for inserting a tie-rod.

using Adjusting spindle M36

The Adjusting spindle M36 is used for vertical adjustment of **horizontal** Top100 tec elements.



Adjusting range **a**: max. 22 cm

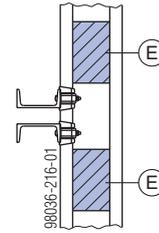
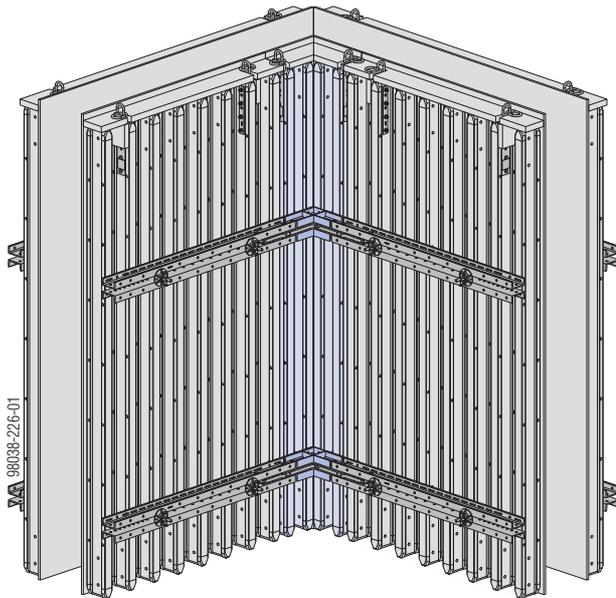
- A** Adjusting spindle M36 (incl. nuts & bolts etc)
- B** Top100 tec waling WU14
- C** Steel plate (site-provided), e.g. 150x100x10 mm

Max. load: 1000 kg

Ways of operating:

- Box nut 24 and Reversible ratchet 1/2"

90 degree corners



E Fit 2 flange reinforcements (strips of formwork sheeting) between the flanges of the outside beam, so that the form-ply of the second corner element is supported.



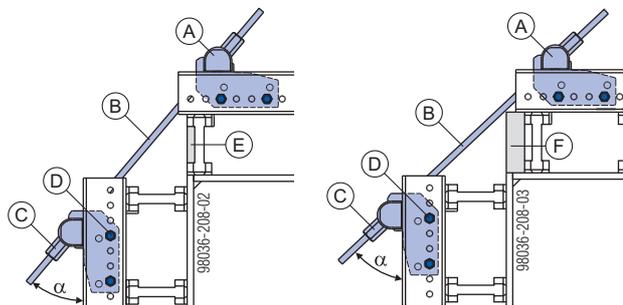
NOTICE

Risk of tie overload if not correctly positioned!
Make sure that the angle tie bracket is pinned into the right holes of the Top100 tec waling!

Outside corners

Top100 tec angle tie bracket WU14

The elements are clamped together with the **Top100 tec angle tie bracket WU14** and Tie-rods 20.0.



α ... 12° - 85°

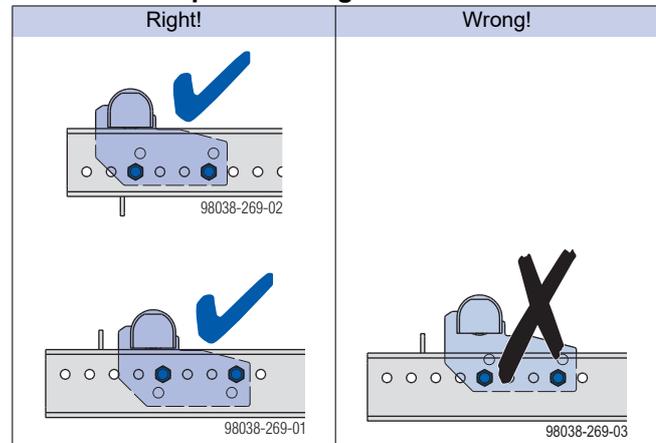
- A** Top100 tec angle tie bracket WU14
- B** Tie-rod 20.0
- C** Hexagon nut 20.0
- D** Connecting pin 10cm
- E** Flange reinforcement with strip of formwork sheeting
- F** Flange reinforcement with continuous plank

Permitted anchor tensile force:

- $\alpha < 37^\circ$: 75 kN
- $37^\circ \leq \alpha \leq 53^\circ$: 90 kN
- $\alpha > 53^\circ$: 75 kN

The **flange reinforcement** prevents the flange of the beam breaking when exposed to high oblique pull from the tie-rod.

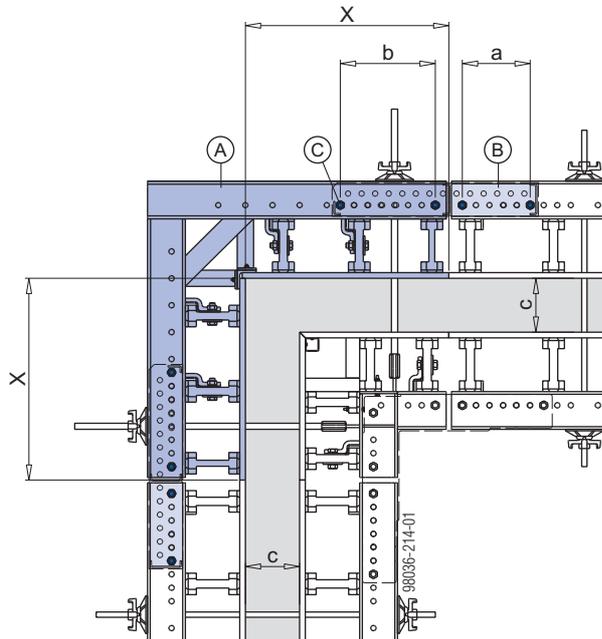
Position of Top100 tec angle tie bracket WU14:



Top100 tec outside corner waling

With the **Top100 tec outside corner waling**, it is possible to make an outside-corner element. The Doka beams give the element the necessary rigidity, and also ensure dimensional accuracy.

Permitted waling load: 110 kN/m



- a ... min. 15 cm (minimum distance between the connecting pins in the element)
 b ... min. 20 cm (minimum distance between the connecting pins in the outside corners)
 c ... wall thickness

Formwork sheet	Corner dimension [X] (where wall thickness c = 20 cm)
21mm	75.0 cm
27 mm	75.6 cm

A Outside corner

B Top100 tec formwork element connector / Top100 tec adjustable waling extension

C Connecting pin 10cm



NOTICE

See 'Element assembly' for more information on this.

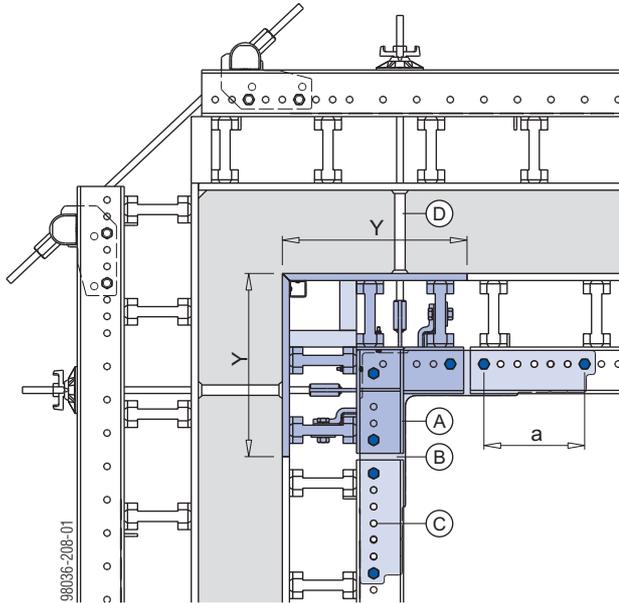
Choosing the right connectors for the Top100 tec elements:

- Wall thicknesses from 20 to 60 cm in a 0.25 cm grid:
 - **Top100 tec adjustable waling extension**
- Wall thicknesses from 20 to 45 cm in a 5 cm grid:
 - **Top100 tec formwork element connector**

Inside corners

Top100 tec inside corner waling

With the **Top100 tec inside corner waling**, it is possible to make an inside-corner element. The Doka beams give the element the necessary rigidity, and also ensure dimensional accuracy.



a ... min. 15 cm (minimum distance between connecting pins)

Formwork sheet	Corner dimension [Y]
21 mm	55 cm
27mm	55.6 cm

- A Inside corner
- B Top100 tec internal angle plate
- C Connecting pin 10cm
- D Tie rod 20.0mm



Tie-rod wrench 15.0/20.0

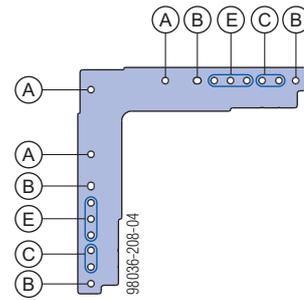
For turning and holding the tie rods.



NOTICE

See the section headed 'Element assembly' for more information on this.

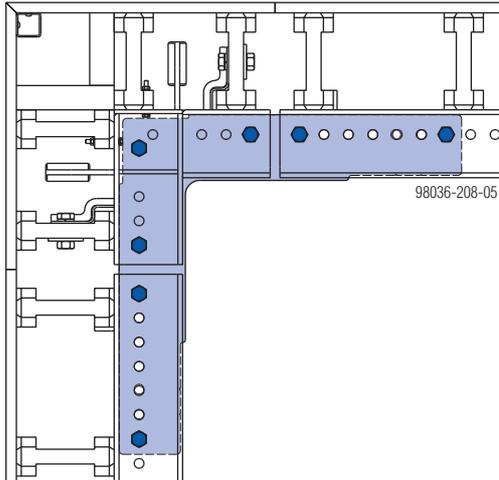
Top100 tec internal angle plate



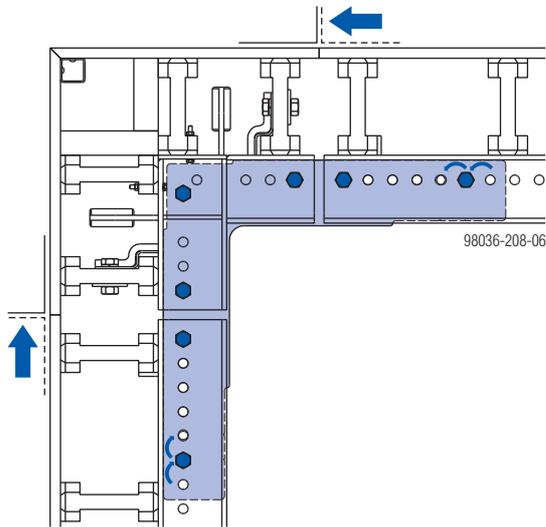
- A Standard holes for placing bolts in the inside corner waling (fixed position)
- B Standard holes for placing bolts in the waling
- C Holes for pull-tight function
- E Holes for filler function

Different ways of fitting the connector

Normal installation situation (zero position)



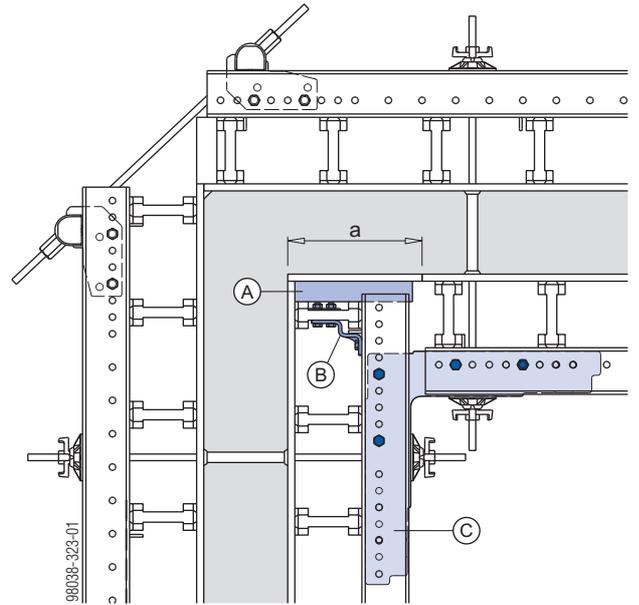
Pull-tight function
(max. 3 mm in a 1.5 mm grid)



Note:

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

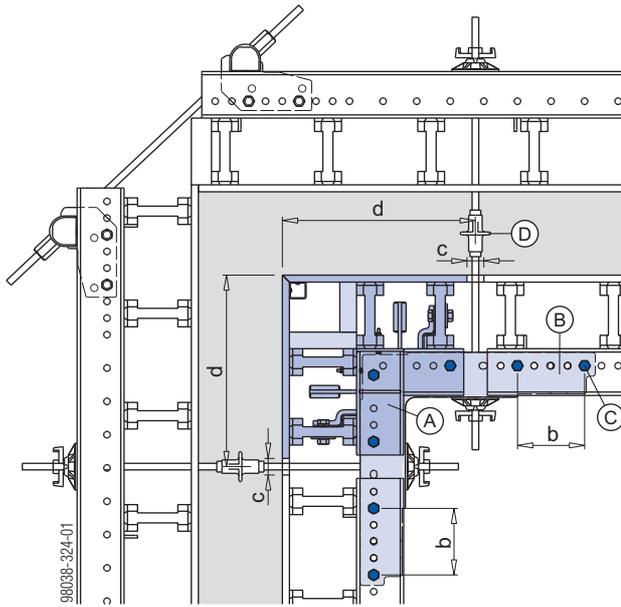
Inside-corner configuration with side-forming shield



a ... 40 cm

- A** Squared timbers 6.2 x 10 x 35 cm
Distance between squared timbers: max. 30 cm
- B** Fastening plate
- C** Top100 tec internal angle plate

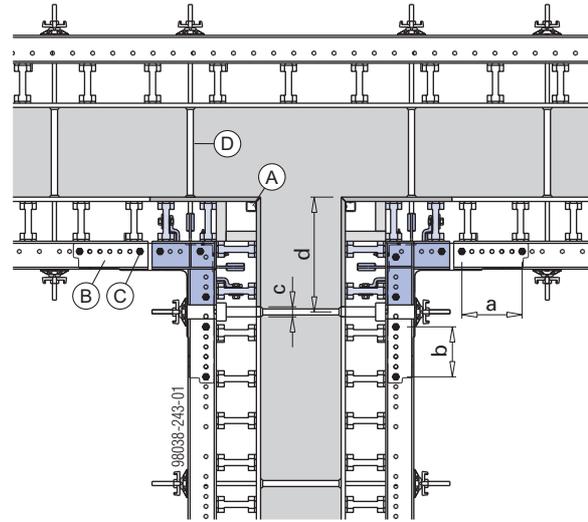
Corner configuration with water-stop connector



- b ... min. 20 cm (minimum distance between connecting pins)
- c ... 5 cm (closure zone for form-tie position)
- d ... 57.5 cm (form-tie position)

- A** Inside corner
- B** Top100 tec internal angle plate
- C** Connecting pin 10cm
- D** Tie-rod system 20.0 with water-stop connector

T-junction

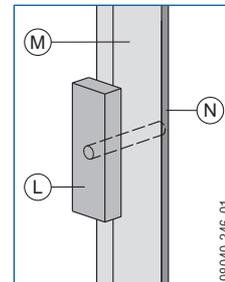


- a ... min. 15 cm (minimum distance between connecting pins)
- b ... min. 20 cm (minimum distance between connecting pins)
- c ... 5 cm (closure zone for form-tie position)
- d ... 57.5 cm (form-tie position)

- A** Inside corner
- B** Top100 tec internal angle plate
- C** Connecting pin 10cm
- D** Tie-rod system 20.0

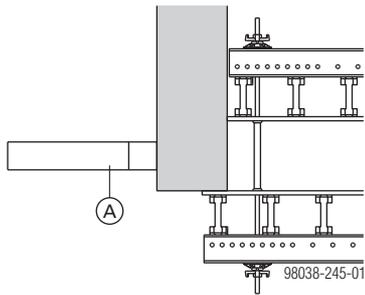
Permitted waling load: 110 kN/m

Squared timbers for 5 cm closure zone:



- L** Squared timber 10x5x30 cm
- M** Squared timber 7x15 cm
- N** Strip of formwork sheeting, 5 cm

Corner connections



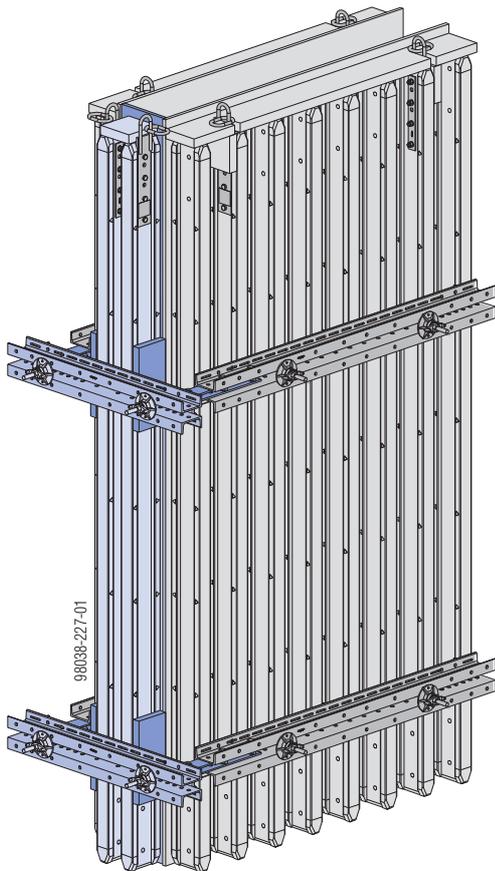
A Site-provided timber brace



NOTICE

Do a static check to determine whether **shoring/tension anchoring** is required to restrain the formwork (horizontal forces on short walls/large wall thicknesses).

Stop-end formwork



NOTICE

Do a static check to determine whether **shoring/tension anchoring** is required to restrain the formwork (horizontal forces on short walls/large wall thicknesses).

Top100 tec anchoring plate

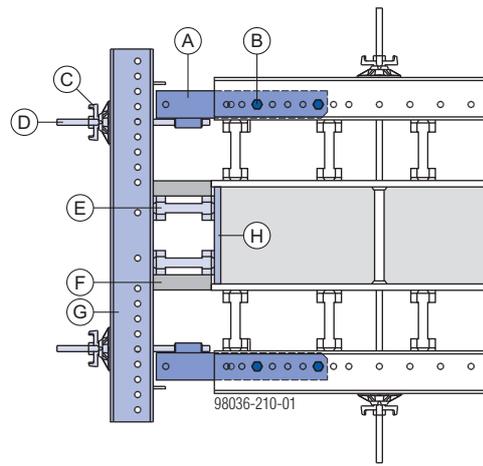
The **Top100 tec anchoring plate** ensures that the loads are safely transferred into the waling system of the Top100 tec elements.

Permitted load on the Tie-rod 20.0 when 2 Connecting pins 10cm are used: 67 kN

Section modulus: 21.6 cm³

Moment of inertia: 97.2 cm⁴

The tie rods are screwed into the anchoring plate, and the correct spacing of the stop-end element is adjusted using the Super-plate 20.0.



A Top100 tec anchoring plate

B Connecting pin 10cm

C Super-plate 20.0 B

D Tie-rod 20.0mm

E Doka beam I tec 20

F Nailed-on plank

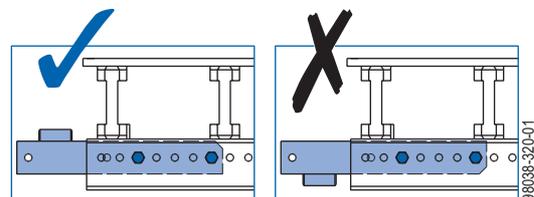
G Top100 tec waling WU14

H Strip of formwork sheeting



NOTICE

Make sure the anchoring plate is fitted in the correct mounting position, as shown here!

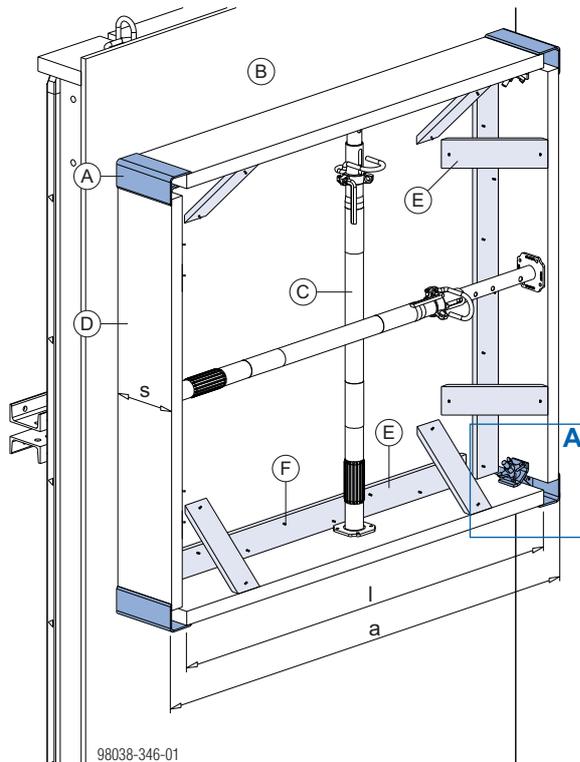


The Top100 tec anchoring plate can also be used for joining Multipurpose walings WS10 and WU12 Top50 to Top100 tec walings WU14.

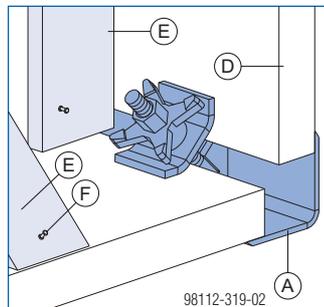
When doing this, always allow for the different load-bearing capacities of these walings!

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 means of the 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** Top 100 tec element
- 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).

Vertical stacking of panels

The vertical-stacking methods shown here are only suitable for:

- lifting
- setting down and
- crane-handling

the formwork.



NOTICE

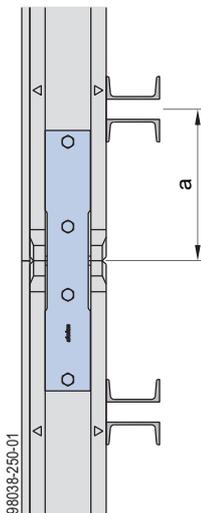
On account of the reduced load-bearing capacity and possible deformation, the application of load from fresh-concrete pressure or concrete weight on the vertical stacking joint is only conditionally permissible.

Consequently, one of the following measures has to be implemented:

- Whenever possible, make the cantilevers short and symmetrical at the beam joints.
- Provide additional waling planes.
- Position the vertical stacking joint at the zero point of the moments.
- Model the vertical stacking joint as an articulation in the statical calculation.

with Stacking plate H20

The Stacking plate H20 serves as a bolt-on longitudinal connector for Doka beams, and is used for vertical stacking of formwork panels. The plate is bolted onto the beams through the pre-drilled holes at either end of the beam.



	Dimension 'a'
Top100 tec element	min. 40 cm
Top100 tec corner element (with Top100 tec outside corner waling or Top100 tec inside corner waling)	min. 48 cm

Permitted moment:

- with Doka beam I tec 20: 2.5 kNm

The number of Stacking plates H20 needed will depend on the overall height of the gang-form:

- **Up to an overall height of 6.0m:** a Stacking plate H20 must be fastened to every 2nd beam.
- **Up to an overall height of 8.0m:** a Stacking plate H20 must be fastened to every beam.

In addition, it is advisable to place extra walings across the horizontal joins, in order to achieve greater stability.

- **Over 8.0 m, up to a max. overall height of 14.0 m:** a Stacking plate H20 must be fastened to every beam.

In addition, it is **absolutely essential** to place extra walings across the horizontal joins, in order to achieve sufficient stability.

Included with product:

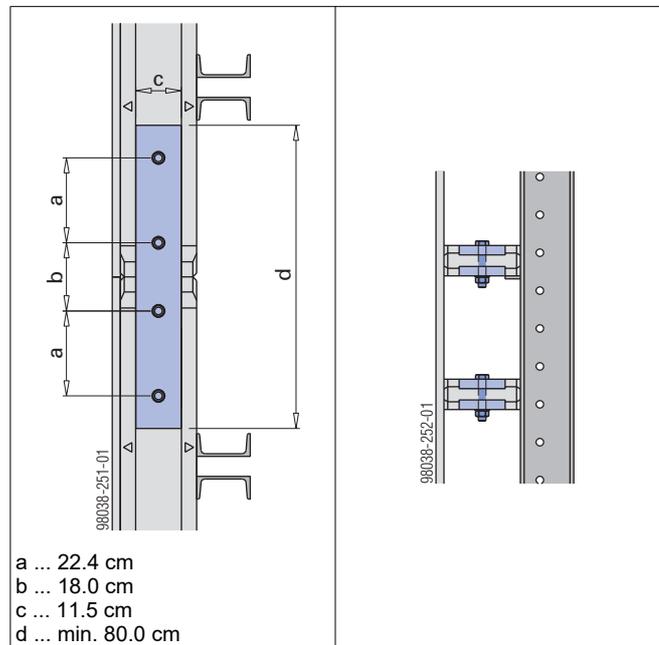
- 4 hexagon bolts M20x80
- 4 hexagon nuts M20
- 4 spring washers A20

Note:

Make sure that the bolted connections are tightened firmly!

with board-plates

An in-situ solution that often works well in practice. The existing holes at the end of the beam can be used for making the bolted connections.



- a ... 22.4 cm
- b ... 18.0 cm
- c ... 11.5 cm
- d ... min. 80.0 cm

Permitted moment: 0.7 kNm

Items needed for each beam joint:

Plank*) 115/25, $l_{min} = 80.0$ cm	2 pcs.
Hexagonal bolt M20x110	4 pcs.
Hexagon nut M20	4 pcs.
Washer 22	4 pcs.

*) It is also possible to use strips of 3-SO 21 or 27 mm formwork sheet instead of the planks.

Shaft formwork

Shaft formwork with Stripping corner I and Transition plate

With the **Stripping corner I**, the entire shaft formwork unit is detached from the wall, in one piece, before being lifted and reset by crane.

Product features:

- No negative impression in the concrete.
- Formwork set-up and stripping function integrated in the inside corner (no need for crane – uses stripping spindles).
- Entire shaft formwork unit is lifted and reset in one piece (with lifting-brackets and four-part lifting chain).

Two different types of **stripping spindle** can be used for setting up and stripping the formwork:

- Framax stripping spindle I with ratchet
- Framax stripping spindle I

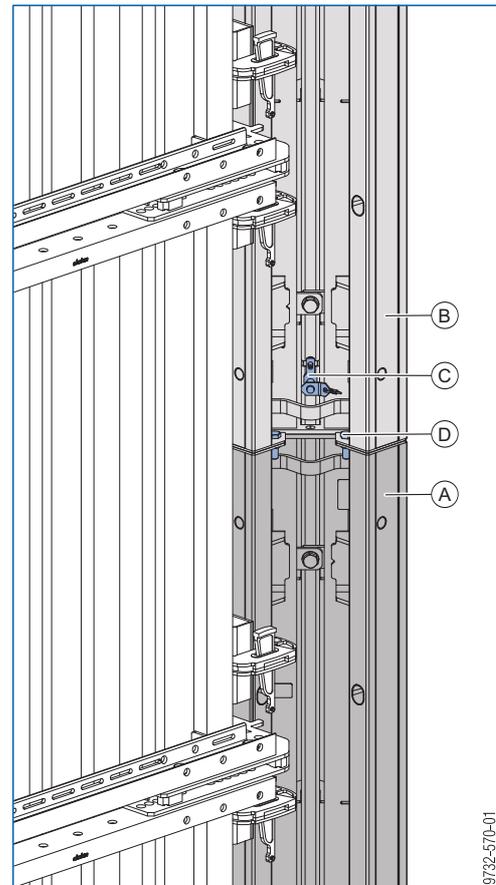
The **Transition plate** makes it possible to use the Framax stripping corner I with Large-area formwork Top 100 tec.

The outside and inside formwork must be dimensioned in line with the structural-design requirements for Large-area formwork Top 100 tec and a **permitted waling load of 90 kN/m!**

Vertical stacking of Framax stripping corners I

- ▶ Connect the bottom stripping corner to the Top 100 tec element.
- ▶ Pull the coupling bolt out of the top stripping corner.
- ▶ Remove the two hexagon bolts from the bottom stripping corner.
- ▶ Engage the top stripping corner flush on the bottom stripping corner.
- ▶ Push the coupling bolt back in.
- ▶ Bolt the stripping corners together with the 2 hexagon bolts and hexagon nuts removed beforehand.

- ▶ Connect the top stripping corner to the Top 100 tec element.



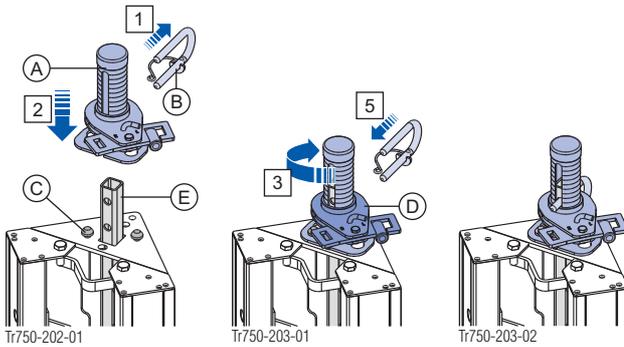
- A Bottom stripping corner I
- B Top stripping corner I
- C Coupling bolt
- D Hexagon bolt ISO 4019 M16x45 8.8 galv. +
Hexagon nut ISO 4032 M16 8 galv.

Animation: <https://player.vimeo.com/video/256373947>

Mounting the Framax stripping spindles I

These mounting instructions apply to both **Stripping spindles I** and **Stripping spindles I with ratchet**.

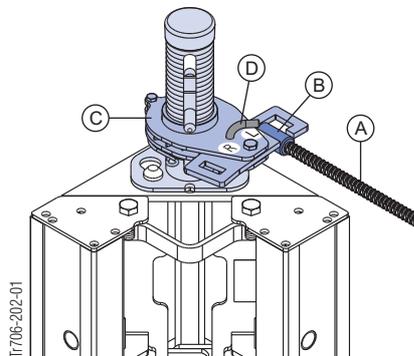
- 1) Pull out the U-bolt from the stripping spindle.
- 2) Place the stripping spindle on the centering stud of the stripping corner.
- 3) Twist the stripping spindle clockwise until fully engaged.
- 4) Position the ratchet or spindle nut between the holes in the push-rod.
- 5) Fix the stripping spindle with the U-bolt.



- A Framax stripping spindle I or Framax stripping spindle I with ratchet
- B U-bolt
- C Centering stud of stripping corner
- D Ratchet or spindle nut
- E Push-rod

Operating the Framax stripping spindle I with ratchet

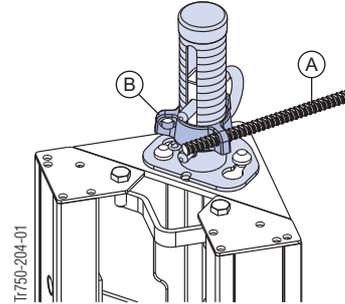
- Screw a Tie-rod 15.0mm into the Weldable coupler 15.0 of the ratchet.
- **Setting up:**
 - shift the change-over lever into the "L" position
 - turn the ratchet **clockwise**
- **Stripping:**
 - shift the change-over lever into the "R" position
 - turn the ratchet **anti-clockwise**.



- A Tie-rod 15.0mm
- B Weldable coupler 15.0
- C Ratchet
- D Change-over lever

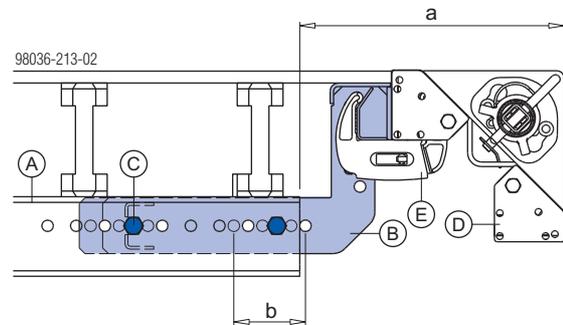
Operating the Framax stripping spindle I

- Push a Tie-rod 15.0mm through one of the holes in the spindle nut.
- **Setting up:** Twist the spindle nut **clockwise**.
- **Stripping:** Twist the spindle nut **anti-clockwise**.



- A Tie-rod 15.0mm
- B Spindle nut

Adjustment range of Transition plate



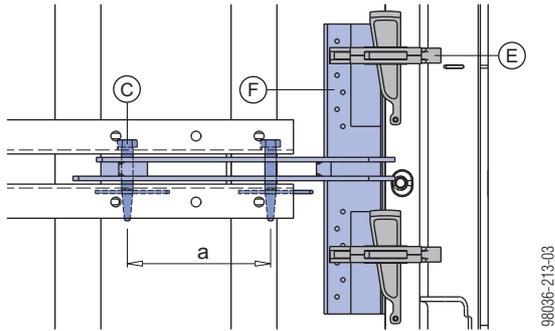
- a ... 41.0 - 53.5 cm
- b ... adjusting range 12.5 cm, in 2.5 cm increments

- A Top100 tec waling WU14
- B Top100 tec transition plate 21mm
- C Connecting pin 10cm and Spring cotter 5mm
- D Framax stripping corner I
- E Quick-acting clamp RU

Possible sizes of shaft

Top100 tec waling WU14 Length [cm]	Width of shaft	
	min. [cm]	max. [cm]
75	165	180
100	180	205
125	205	230
150	230	255
175	255	280
200	280	305
225	305	330
250	330	355
275	355	380
300	380	405

Connections



a ... 25 cm minimum distance between the connecting pins

- C** Connecting pin 10 cm with Spring cotter 5mm
- E** Framax quick-acting clamp RU
- F** Framax screws (not included in scope of supply)



NOTICE

Minimum distance between the connecting pins in the Top100 tec waling: 25 cm



NOTICE

In order to obtain the full available stripping-play, make sure that the Framax quick-acting clamps RU are mounted at staggered heights (i.e. not opposite one another).

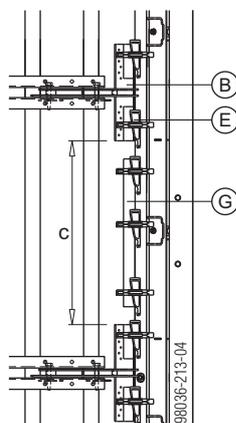
Supporting the plywood face

Max. spacing c [cm] between 2 transition plates (form-ply not supported by Framax moulded timber or squared timber)

Type of formwork sheet	Permitted formwork pressure [kN/m ²]				
	30	40	50	60	70
3-ply sheet 21mm	15	10	10	--	--
Multi-ply sheet 21mm	50	40	35	30	25

Number of quick-acting clamps RU needed where form-ply is supported by Framax moulded timbers

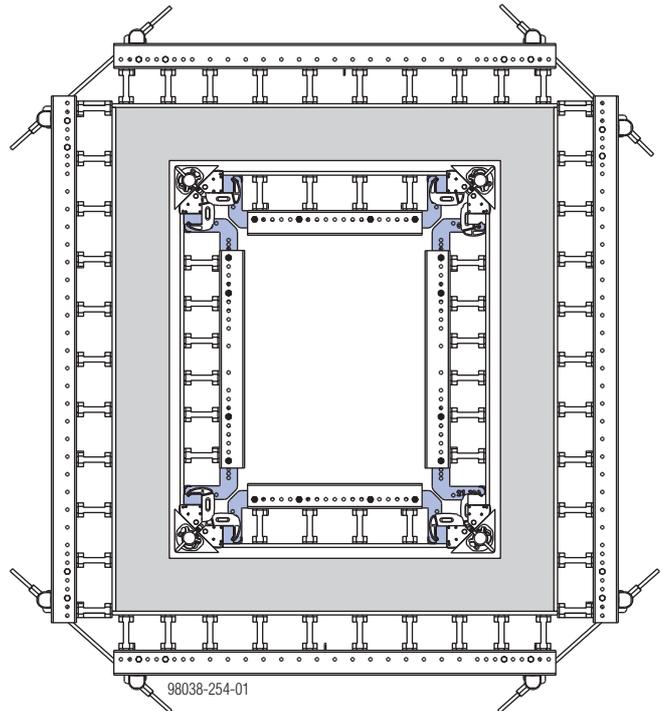
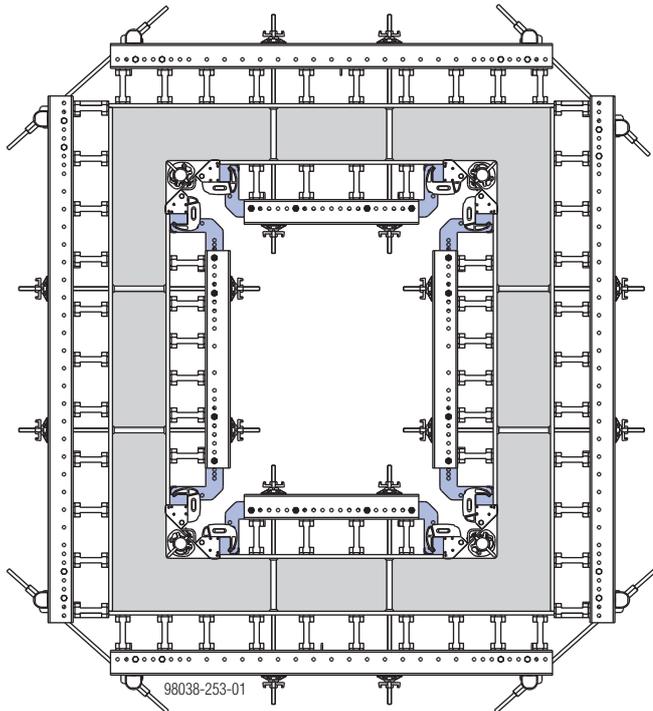
Spacing c [cm]	N° of quick-acting clamps RU
max. 30	1
max. 60	2
max. 90	3
max. 120	4
max. 150	5



- B** Top100 tec transition plate 21mm
- E** Framax quick-acting clamp RU
- G** Framax moulded timber or squared timber

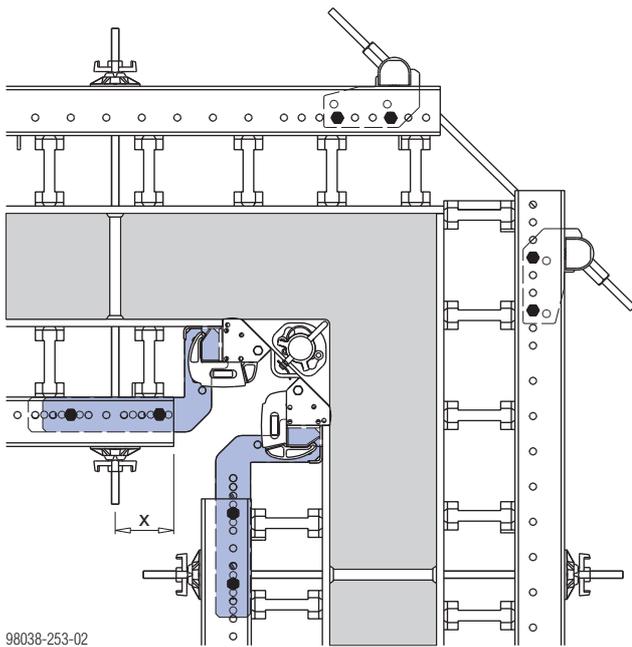
Shaft formwork closed ready for pour

Shaft formwork stripped ready for lifting

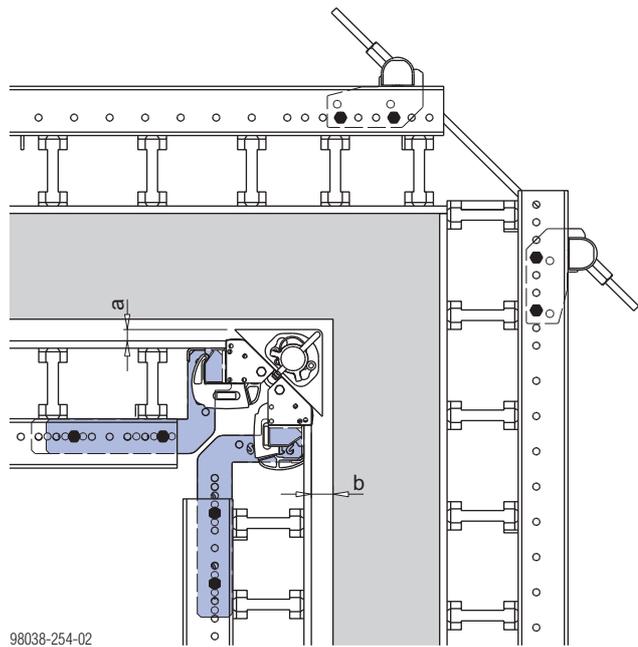


Form-tie zones:

Stripping play:



x ... 16.5 - 22.0 cm



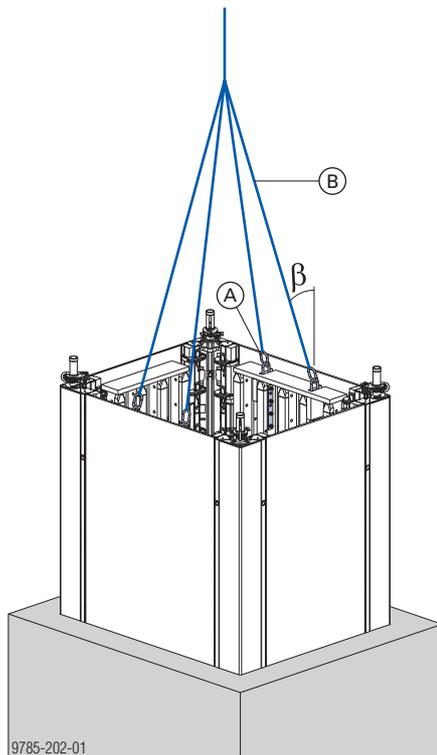
a ... 3.0 cm
b ... 6.0 cm



NOTICE

- Only tie through the waling.
It is not permitted to tie through the Transition plate.

Lifting by crane



β ... max. 15°

A Lifting-bracket

B Four-part lifting chain



The crane hook on the Stripping corner I is not allowed to be used for lifting the shaft formwork.

► The shaft formwork must **only be lifted using lifting-brackets**, or in one piece with the shaft platform.

Permitted weight of the shaft formwork:

4000 kg with 4 lifting-brackets

Reason: 15° oblique pull in both directions

Doka shaft platform

With its telescopic shaft beams, this platform can accommodate any dimension of structure. The inside formwork can be "parked" on the platform and repositioned together with the platform.



Follow the directions in the 'Shaft platform' User Information booklet.

Circular formwork

The use of special connecting plates enables curved structures to be formed.

Profiled timber formers are placed between the Doka beams and the form-ply to provide the desired shape.

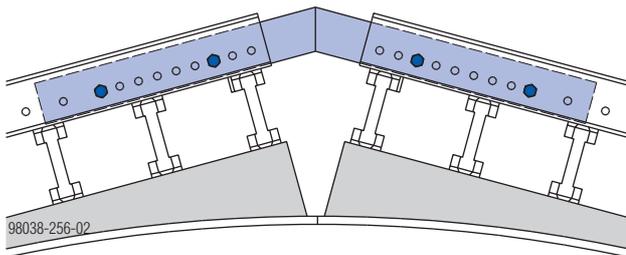
Minimum bending radii of Doka formwork sheets:

Formwork sheet	Grain direction of face layer	Min. radius [m]
Dokaplex 9mm	Transverse	2.0
	Longitudinal	3.5
Dokaplex 18mm	Transverse	4.0
	Longitudinal	7.0
Dokaplex 21mm	Transverse	5.0
	Longitudinal	8.0
Doka 3-SO 21mm	Transverse	3.5
	Longitudinal	8.0
Doka 3-SO 27mm	Transverse	5.0
	Longitudinal	10.0

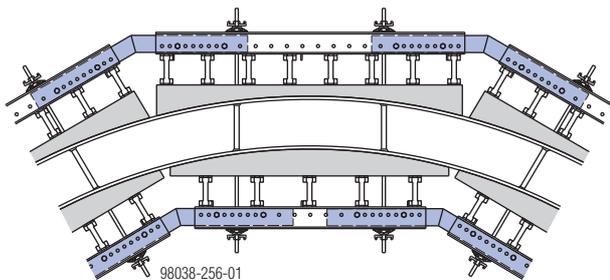


Smaller radii can be achieved by cutting into the formwork sheets or by using strips of formwork sheeting.

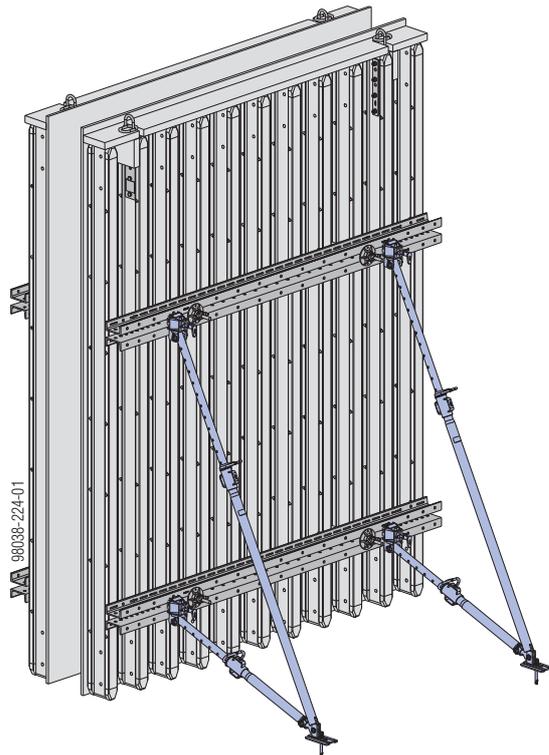
using special connecting plate



Example - formwork for a circular tank



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

Permitted spacings [m] of the plumbing accessories:

Formwork height [m]	Panel strut		Eurex 60 550
	340	540	
3.00	4.00		
4.00	3.00		
5.00		3.00	
6.00		2.00	
7.00	4.00		4.00
8.00	3.00		4.00

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!

Note:

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

Example: Where the formwork height is 7.00 m, the following are needed for every 8.00 m wide gang-form:

- 2 Panel struts 340
- 2 Eurex 60 550



Universal dismantling tool

For easy operation of the spindle nuts.



Possible ways of connecting in the Top100 tec waling

Horizontal waling		Vertical waling
Method 1	Method 2	
 98038-270-01	 98038-270-02	 98038-270-03

A Prop head EB

B Connecting pin 10cm + Spring cotter 5mm

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
 9727-343-01	 9745-214-01

a ... diam. 26 mm

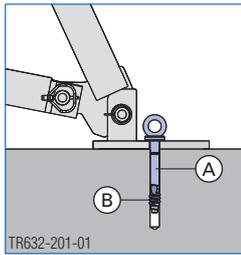
b ... diam. 18 mm (suitable for Doka express anchors)

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/mm² (C12/15 grade concrete)



Follow the Fitting Instructions!

Required safe working load of alternative anchors for foot-plates:

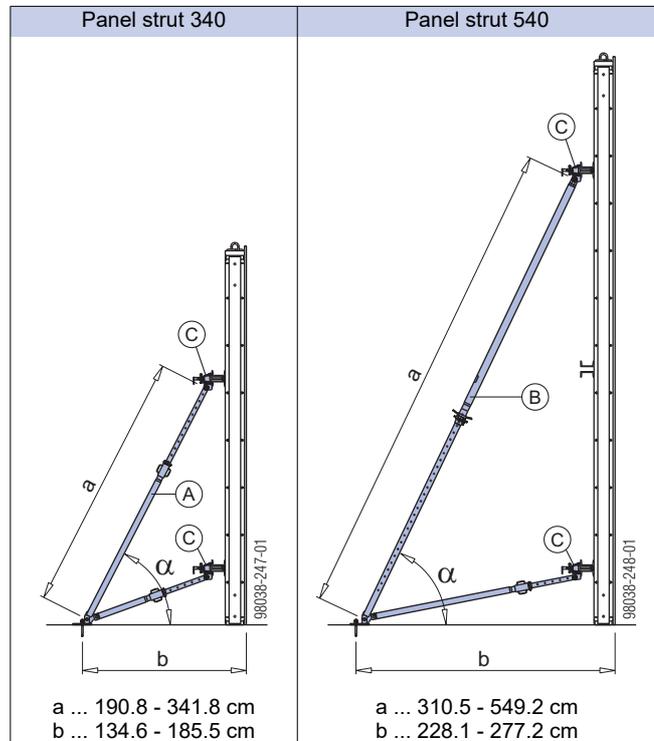
$R_d \geq 20.3 \text{ kN}$ ($F_{\text{permissible}} \geq 13.5 \text{ kN}$)

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)



α ... approx. 60°

A Panel strut 340 IB

B Panel strut 540 IB

C Prop head EB

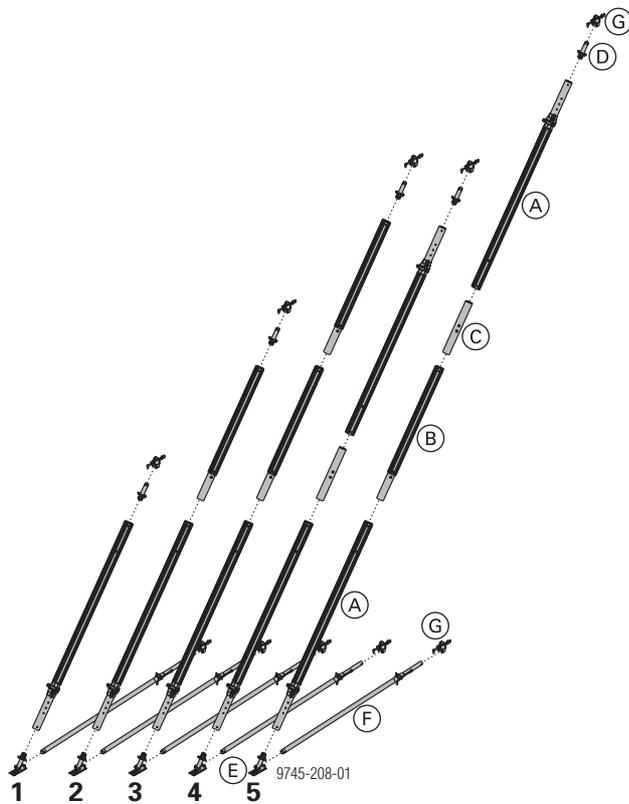
Eurex 60 550 used as a shoring & plumbing accessory

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

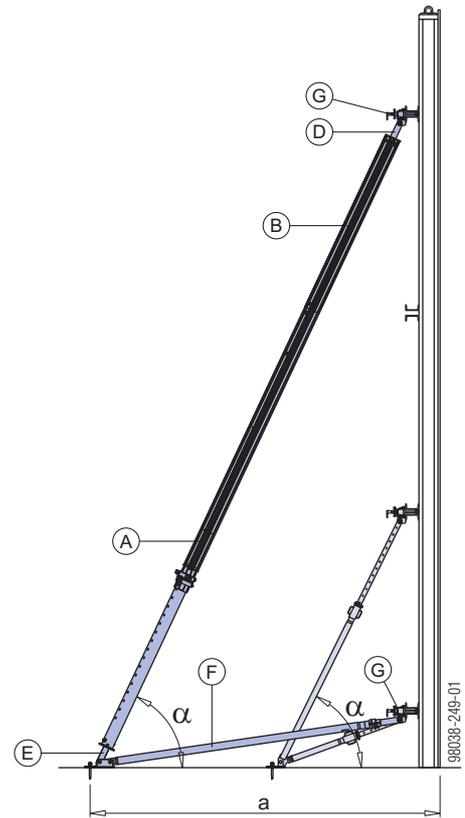
- Can be connected directly – without modification – to Doka framed formwork and Doka timber-beam formwork
- The "Adjusting strut 540 Eurex 60 IB" makes handling much easier, especially when the formwork is being transferred.
- Can be telescoped in 10 cm increments, with continuous fine adjustment.



Follow the directions in the "Eurex 60 550" User Information!



Example of a possible combination of Type 2



a ... 361.0 - 600.4 cm
 α ... approx. 60°

- A** Plumbing strut Eurex 60 550
- B** Extension Eurex 60 2.00m
- D** Connector Eurex 60 IB
- E** Plumbing strut shoe Eurex 60 EB
- F** Adjusting strut 540 Eurex 60 IB
- G** Prop head EB

A good rule of thumb here is:

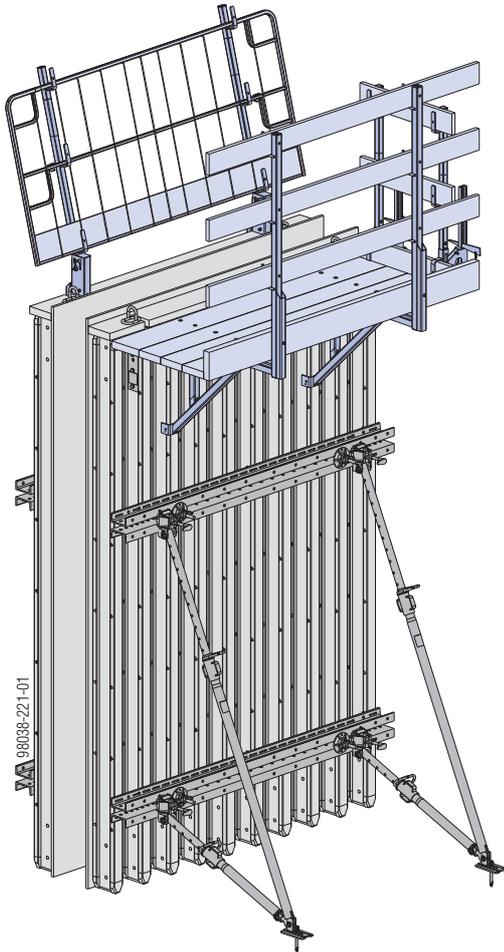
The length of the shoring & plumbing accessory (i.e. the complete Eurex 60 550 plumbing-strut assembly) = the height of the element to be shored.

Type	Extension length 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

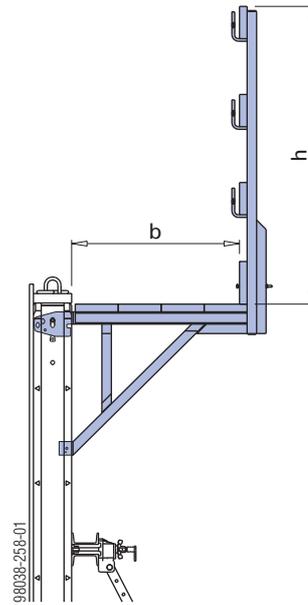
Pouring platforms with single brackets

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 bracket 90



b ... 87 cm
h ... 160 cm

Permitted service load: 1.5 kN/m² (150 kg/m²)

Load Class 2 to EN 12811-1:2003

Max. influence width: 2.00 m

Deck and guardrail boards

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

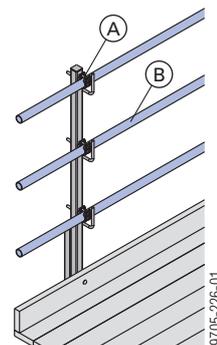
- Deck-boards min. 20/5 cm
- Guardrail boards min. 15/3 cm

Deck-boards and guardrail boards: Per 1 metre length of platform, 0.9 m² of deck-boards and 0.8 m² 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

Preconditions for use:

Observe all applicable safety regulations.

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

Ensure that the formwork gang has sufficient stiffness.

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



NOTICE

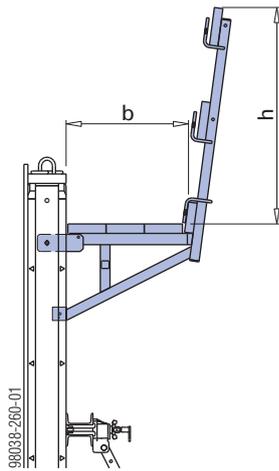
The brackets must be secured against accidental lift-out

Note:

The plank and board thicknesses given here comply with the C24 category of EN 338.

Observe all national regulations applying to deck-boards and guardrail boards.

Top scaffold bracket L



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

Permitted service load: 1.5 kN/m² (150 kg/m²)

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:

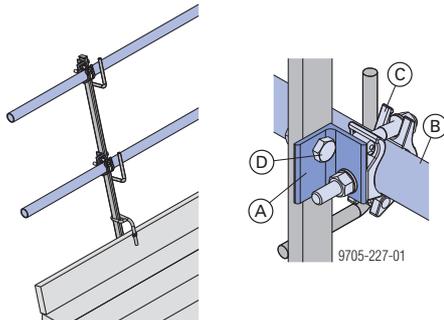
- Deck-boards min. 20x5 cm
- Guardrail boards min. 15x3 cm

Deck and guardrail boards: Per 1 metre length of platform, 0.65 m² of floor decking and 0.6 m² of guardrail 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)

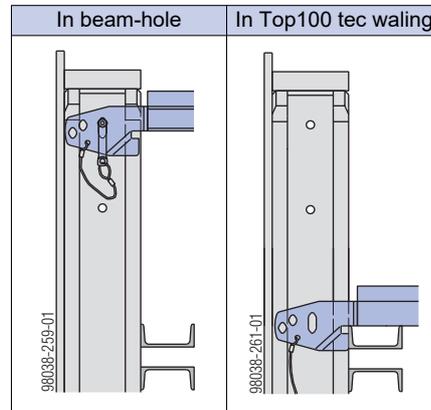
Possible ways of fixing



WARNING

Risk of accidental lift-out if the bracket is fixed to a Top100 tec waling!

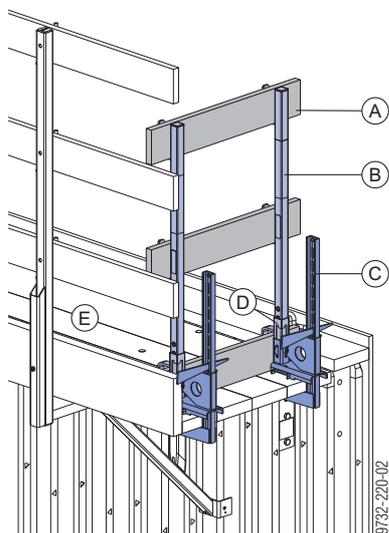
- ▶ Fix the bottom strut of every bracket with 28x60 nails or a hexagon screw M10x140 and hexagon nut M10, on both sides of the strut.



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

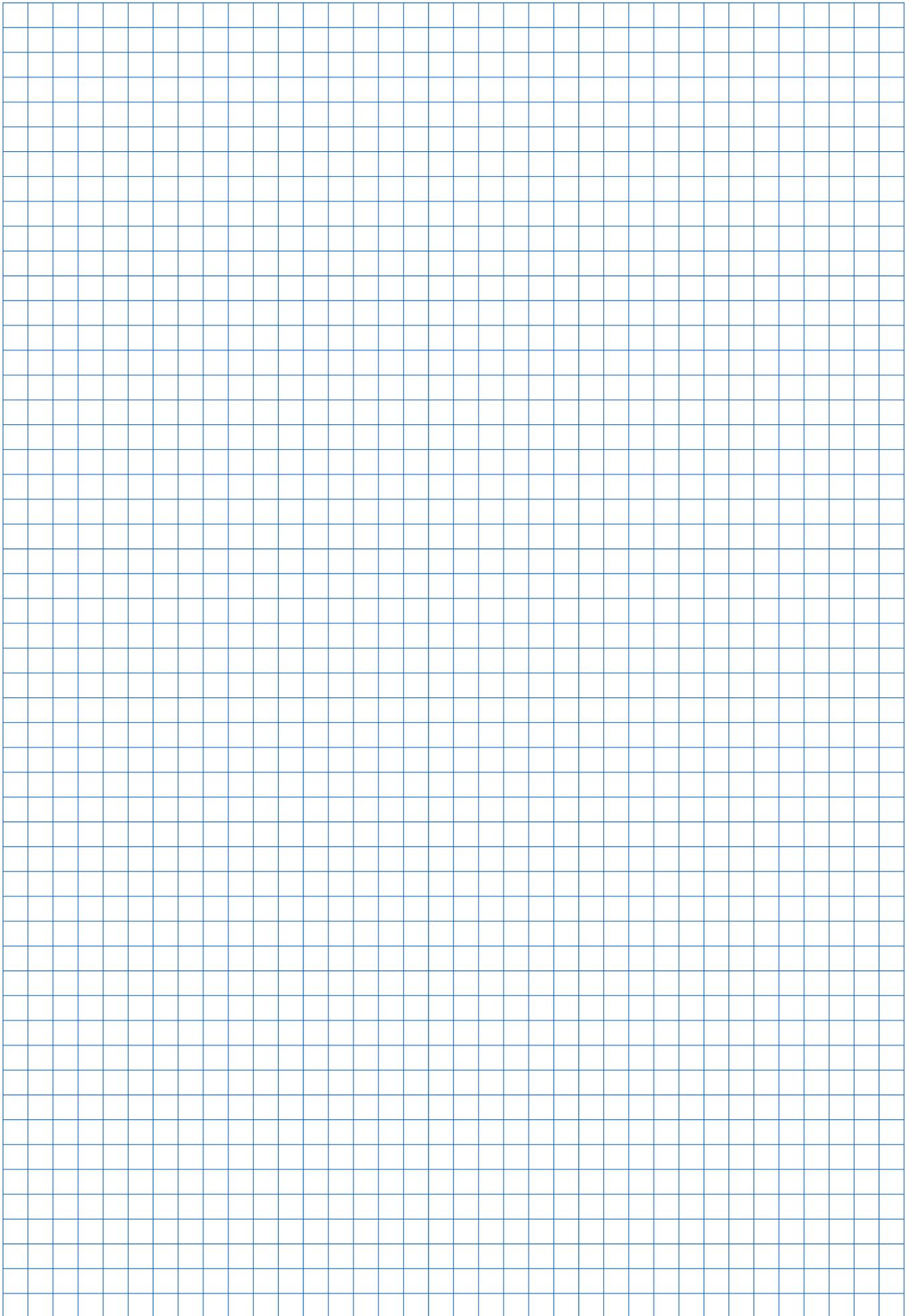
How to mount:

- ▶ 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 guardrail boards to the handrail post plates with nails (diam. 5 mm).

Handrail clamp S

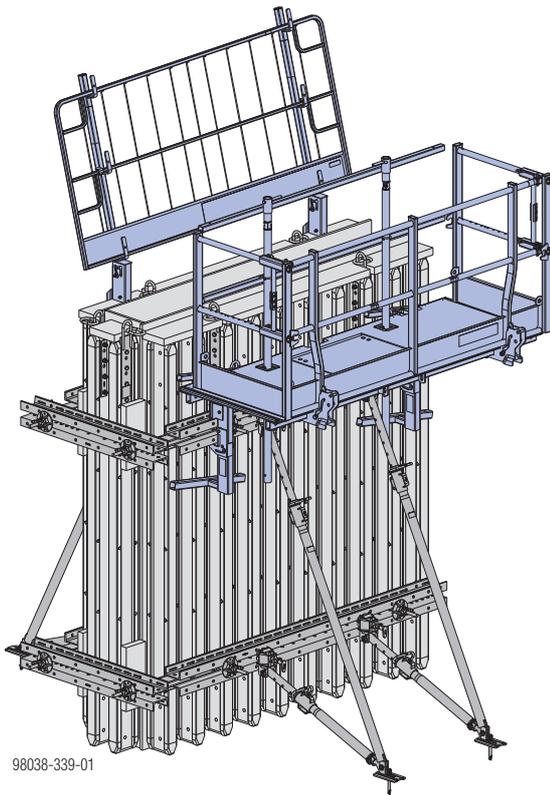


Follow the directions in the “Handrail clamp S” User information!



Pouring platforms

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

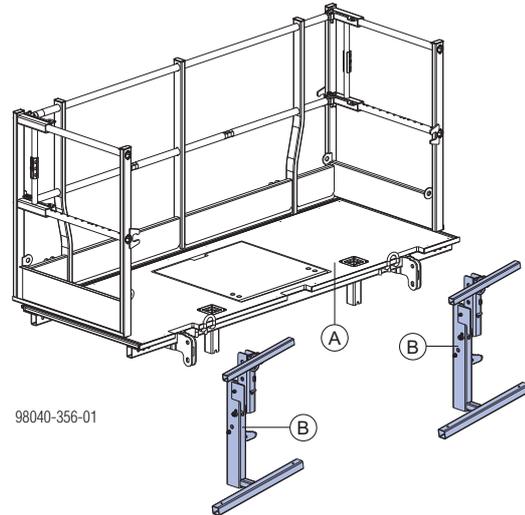


Xsafe plus platform

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.



Follow the directions in the 'Platform system Xsafe plus' User Information booklet!



A Xsafe plus platform

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

Permitted service load: 1.5 kN/m² (150 kg/m²)

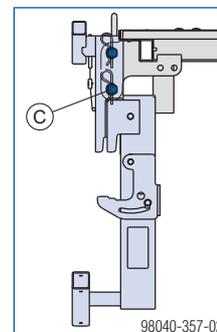
Load Class 2 to EN 12811-1:2003

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 2.50m: 6.00 m

Mounting the lifting adapter onto the platform:

- ▶ Use a Connecting pin 10cm and Spring cotter 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.

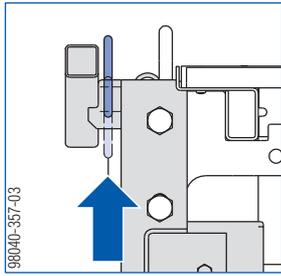
Shore the formwork in a windproof manner when erecting it and when it is temporarily placed in the standing position.

Ensure that the formwork gang has sufficient stiffness.

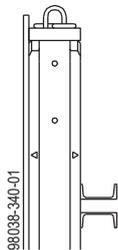
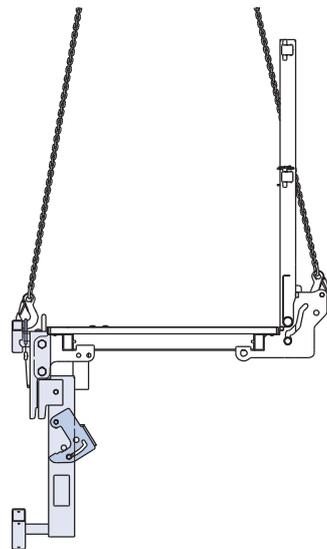
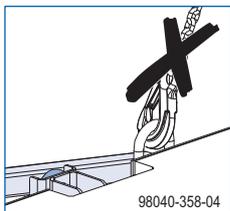
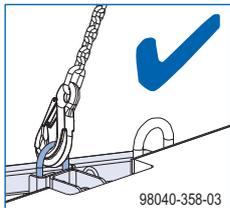
Observe all applicable safety regulations.

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.

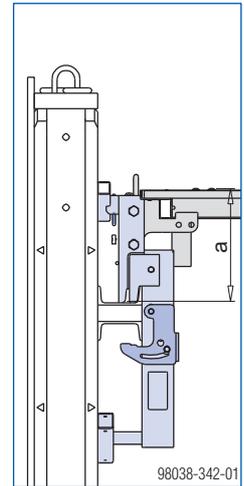
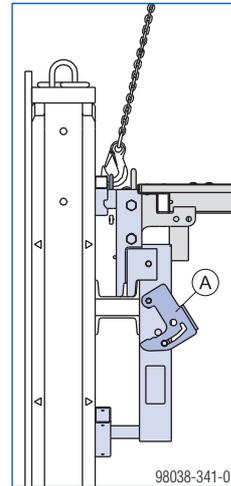


- ▶ Fix the platform in the top waling.
- ▶ Detach the four-part lifting chain. The safety hooks latch into place automatically.



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

The platform is now secured against accidental lift-out.



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

A Safety 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 safety hook, the platform is automatically unlocked.



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

Extending the platform to either side

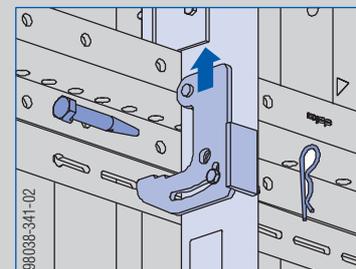
The platform can be lengthened at either end by using the **Xsafe plus platform extension 0.60m**.



CAUTION

Platforms with platform extensions can tip up. Falling hazard!

- ▶ Do not step onto the **platform extension** until the safety hooks have been fixed in place.
- ▶ **Fix the safety 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

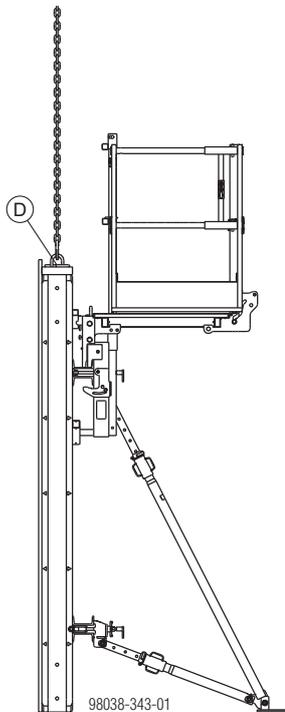
The formwork and the Xsafe plus platform can be moved / lifted in one piece.



NOTICE

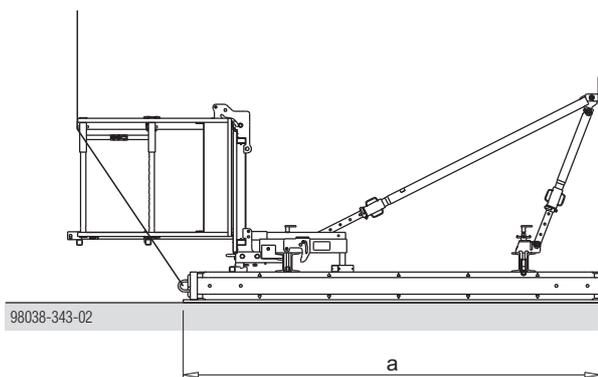
If the formwork is lifted with the pouring platform still mounted to it, the platform must be secured so that it cannot slip to either side.

Repositioning:



D Lifting-bracket

Lifting / laying down:



a ... max. 6.00 m



CAUTION

It is not permitted to lift or lay down formwork units with heights of >6.00 m!

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

Opposing guardrail

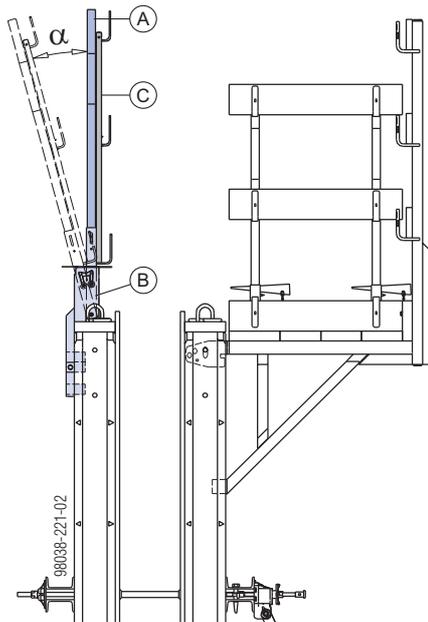
If there are work platforms mounted on one side of the formwork only, then a fall-protection barrier must be mounted to the opposing formwork.

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

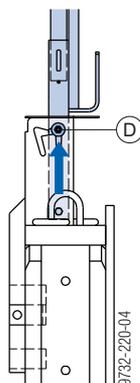


$\alpha \dots 15^\circ$

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

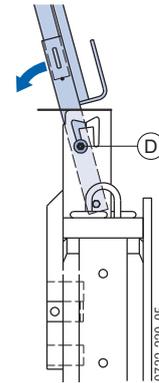
If necessary (e.g. to enlarge the available work-space during pouring), the safety barrier can be tilted outward by 15° .

- 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:

Protective grating XP 1.20m	Protective grating XP 0.60m	Guardrail boards

- a ... 143 cm
- b ... 93 cm
- c ... min. 100 cm
- d ... 103 cm

- E Handrail post XP 1.20m
- F Handrail post XP 0.60m
- G Protective grating XP 1.20m
- H Protective grating XP 0.60m
- I Platform decking
- J Guardrail board



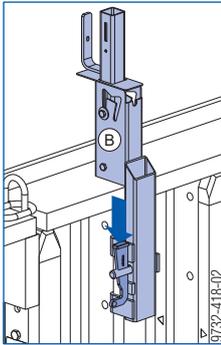
NOTICE

- When Protective gratings XP 0.60m are used to make the safety barrier, note the necessary minimum distance of 100 cm from platform decking to top of railing!
- When guardrail boards are used to make the safety barrier, it is not permissible to install guardrail boards in the top handrail-post plates.

Assembly

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

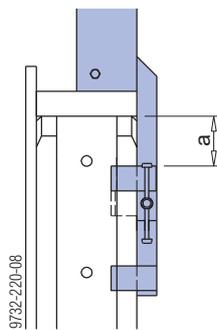
- ▶ Mount the Timber-beam formwork adapter XP to the Top 100 tec element, fixing it on firmly with the wedge.



B Timber-beam formwork adapter XP

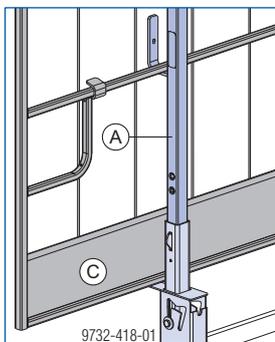


Make sure that the adapter is fitted on correctly and is resting solidly on the top plank (there must be 10 cm between the clamping part and the end of the beam)!



a ... 10 cm

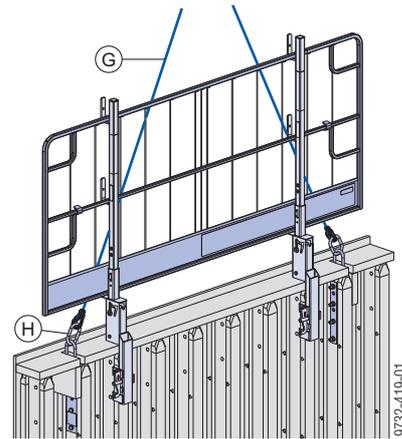
- ▶ Push the Handrail post XP 1.20m into the post-holding fixture on the Timber-beam formwork adapter XP until the locking mechanism engages.
- ▶ Fit on a Protective grating XP or guardrail boards.
- ▶ Fix the Protective grating XP to the Handrail post XP with Velcro® fasteners 30x380mm, or fix on the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



A Handrail post XP 1.20m

C Protective grating or guardrail boards

Lifting by crane

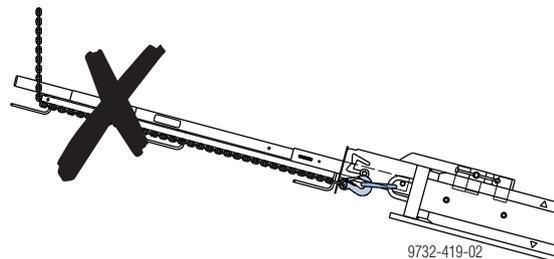


G Doka 4-part chain 3.20m

H Lifting-bracket

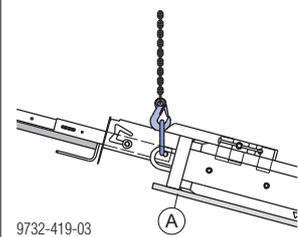
When lifting gang-forms together with opposing guardrails assembled from the Edge protection system XP, remember the following points:

- 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.

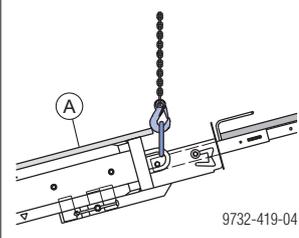


Make sure that the 4-part chain is in the right position:

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

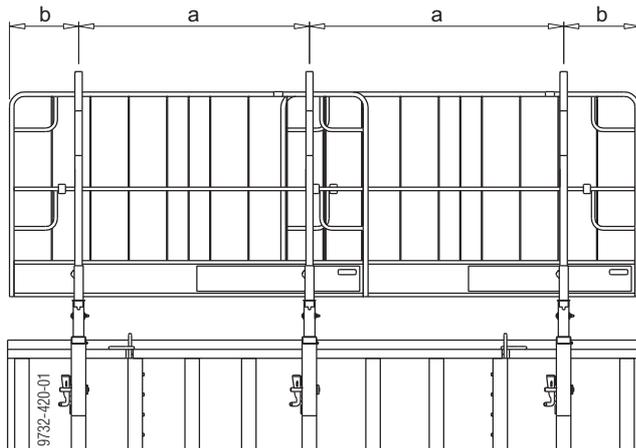


- Placing down onto the back-face of the formwork (e.g. for cleaning the form-facing)
- Picking up from the cleaning position
- Repositioning the upright gang-form



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 ²]			
		0.2	0.6	1.1	1.3
Permitted support centres	Protective grating XP	2.5 m			-
	Guard-rail board 2.4 x 15 cm	1.9 m			
	Guard-rail board 3 x 15 cm	2.7 m	2.4 m	2.0 m	
	Guard-rail board 4 x 15 cm	3.3 m	2.4 m	2.0 m	

Permitted cantilever (b)

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

Wall formwork at the edge of the structure

The **Wall-formwork support angle** is a support for positioning wall formwork at the edge of the structure if there is no suitable load-bearing base (e.g. platform).

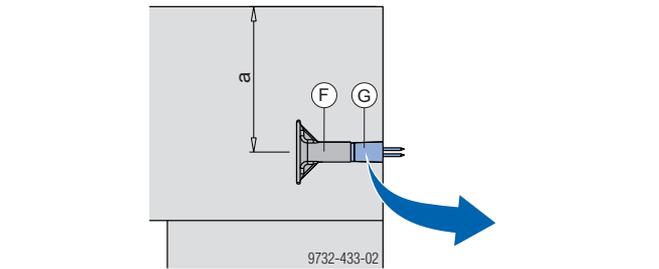
Characteristic cube compressive strength of the concrete ($f_{ck,cube}$):
min. 15 N/mm² (C12/15 grade concrete)

- NOTICE**
- Static verification is required!
 - Make sure that the bottom plank is securely and solidly fixed to the formwork element!
 - Installation of the support angle and tying of the elements are jobs undertaken by crew members working from the leading façade scaffolding!

Note:
A **Bridge edge beam anchor 15.0** has to be set into the concrete when the preceding section is poured so that the support angle can be secured to it.

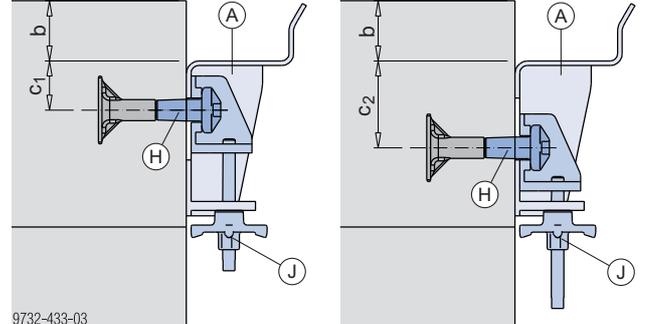
 Follow the directions in the 'Bridge edge beam anchor 15.0' Fitting Instructions.

Installation:
➤ Remove the nailing cone from the bridge edge beam anchor.

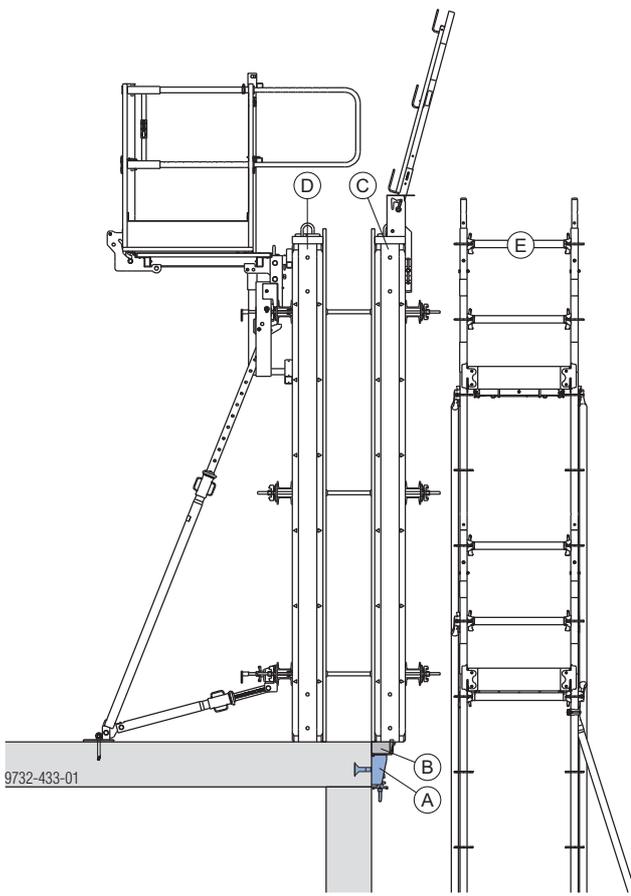
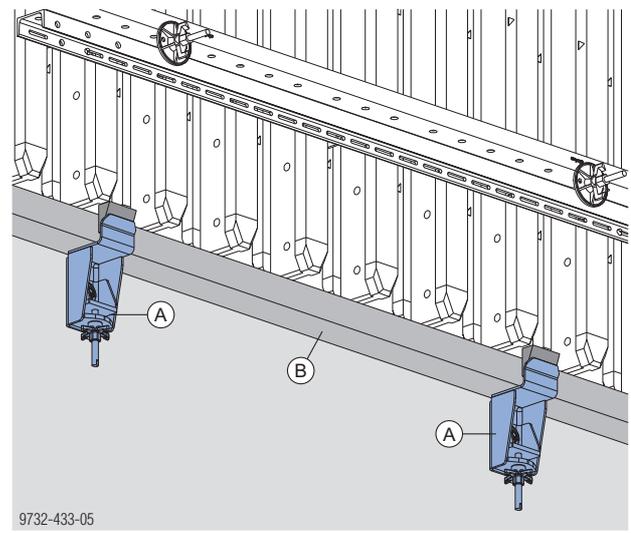


a ... min. 15.5 up to max. 19.5 cm
F Bridge edge beam anchor 15.0
G Nailing cone 15.0

- Secure the support angle to the bridge edge beam anchor with a Screw-in cone 15.0 (but do not yet tighten).
- Use the star grip nut for adjusting to the necessary level (**b**).
- Tighten the Screw-in cone 15.0.



b ... 8,0 cm (offset for bottom plank)
Adjustment range c₁ ... 6.5 cm to c₂ ... 11.5 cm
A Wall-formwork support angle
H Screw-in cone 15.0
J Star grip nut



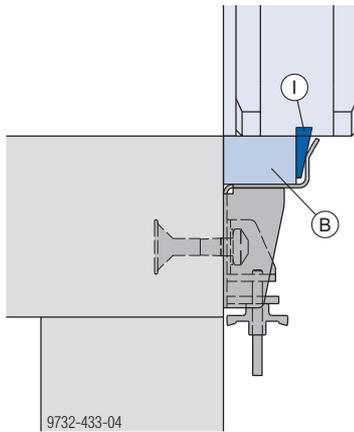
- A** Wall-formwork support angle
- B** Bottom plank 120x80 mm (WxH) mounted on the opposing formwork
- C** Opposing formwork
- D** Holding formwork
- E** Façade scaffolding (e.g. Working scaffold Modul)

Max. load-bearing capacity:
2000 kg / Wall-formwork support angle



Check that the support angle is correctly seated flat against the wall.

- ▶ Position the holding formwork.
- ▶ Lower the opposing formwork on to the support angle by crane.
- ▶ Use a wedge to tighten the bottom plank of the opposing formwork against the wall/slab.



B Bottom plank

I Wedge

- ▶ Fit the anchors.



Before disconnecting from the crane:

- ▶ 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.

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

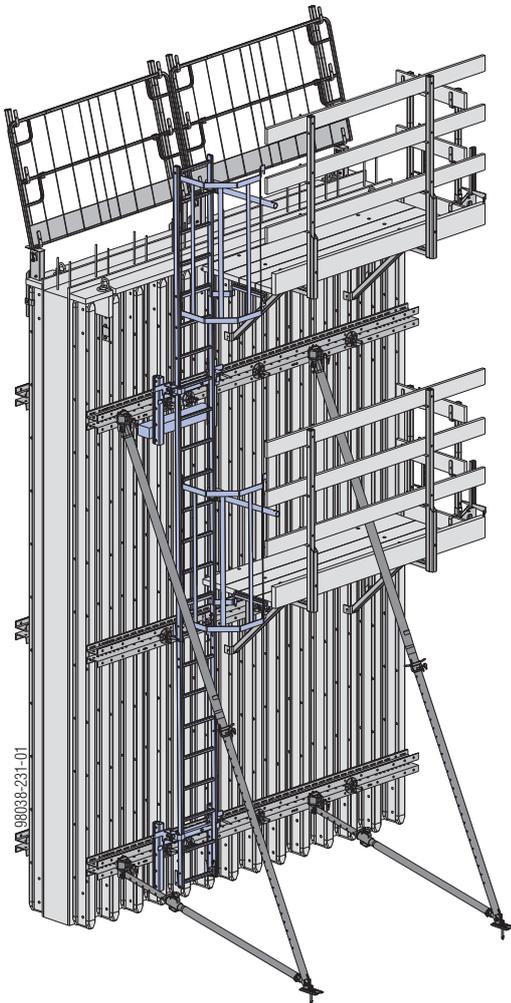
Note:

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

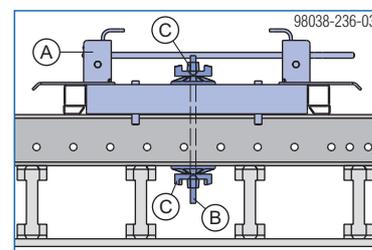
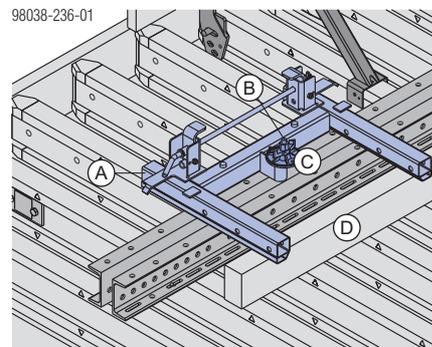
- ▶ Pre-assemble elements face-down on an assembly bench (see "Inter-panel connections").
- ▶ Mount the platforms to the face-down element (see "Pouring-platforms with single brackets").
- ▶ Mount panel struts to the face-down element (see "Plumbing accessories").

Attaching connectors to the formwork



NOTICE

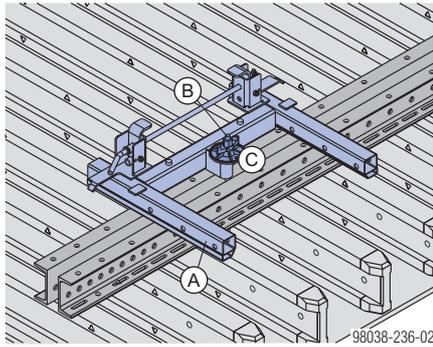
- ▶ The Ladder system XS is normally mounted inside an element (i.e. not to either side of it).
- ▶ If this is not possible (e.g. because of a supporting construction frame), then a beam grille (consisting of min. 4 Doka beams) can be attached on one side of the element to make this possible. This also makes it possible to change quickly to another position.
- ▶ Place the 'Connector XS wall formwork' onto the Top100 tec 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.



- A Connector XS for wall formwork
- B Tie-rod 15.0 (length 0.40 m)
- C Super-plate 15.0
- D Squared timber 10x14 cm (site-provided)

- ▶ Place the 'Connector XS wall formwork' onto the Top100 tec waling near the bottom of the formwork (no need for a squared timber).

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



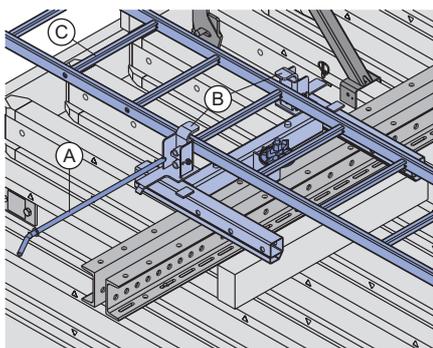
- A Connector XS wall formwork
- B Tie-rod 15.0 (Length = 0.40 m)
- C Super plate 15.0

- ▶ For formwork heights above 5.85 m, an extra Con- nector 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.

Fixing the ladder

to the top "Connector XS Wall formwork"

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



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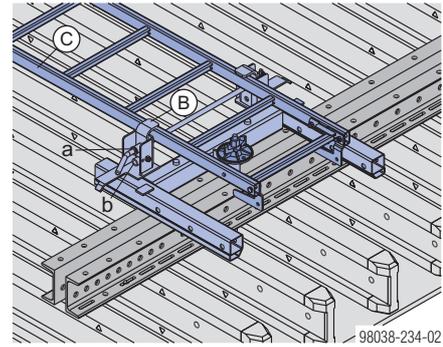
- in the front position (a)

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

to the bottom "Connector XS Wall formwork"

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

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

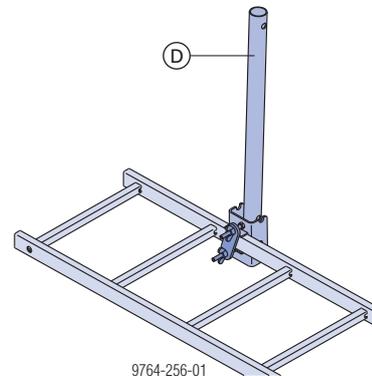


98038-234-02

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

- B Safety hooks
- C Ladder XS

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



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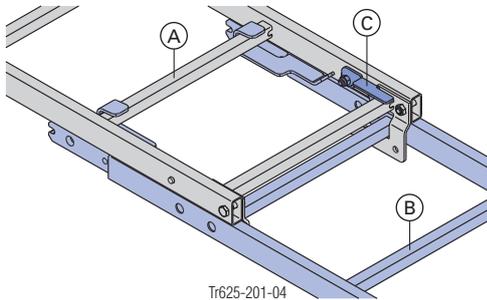
- D Securing barrier XS

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

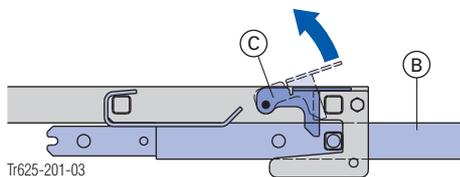
Ladder system XS for heights above 3.75 m

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

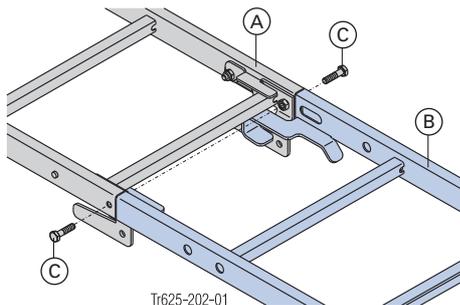


- A System ladder XS 4.40m
- B Ladder extension XS 2.30m
- C Safety latch

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 **very slightly!**



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

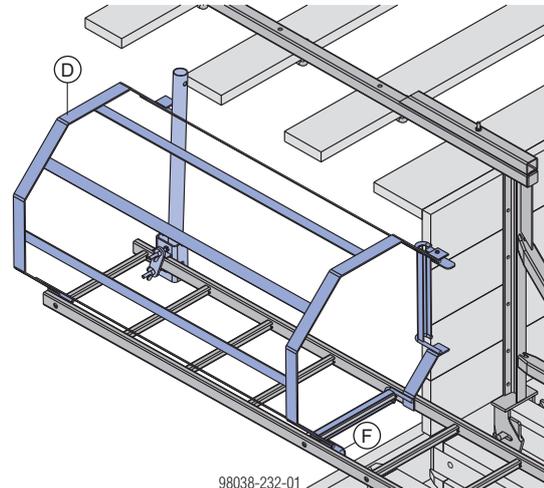
- A System ladder XS 4.40m
- B Ladder extension XS 2.30m
- C Screws, width-across 17 mm

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



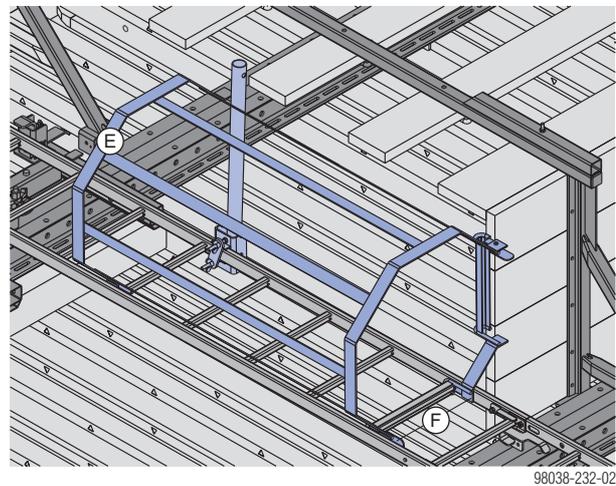
NOTICE

- ▶ Always observe all relevant safety regulations applying to the use of the Ladder cage XS 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

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



- E Ladder cage XS
- F Safety latches (lift-out guard)

Items needed

Connectors + ladder	Formwork height		
	2.70-3.25 m	>3.25-6.00 m	>6.00-8.00 m
Connector XS for 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 10x14 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	>7.65-8.00 m
Ladder cage exit XS ¹⁾	1	1	1	1	1	1
Securing barrier XS ¹⁾	1	1	1	1	1	1
Ladder cage XS 1.00m ¹⁾	0	1	2	3	4	5

¹⁾ No allowance made here for intermediate exits.

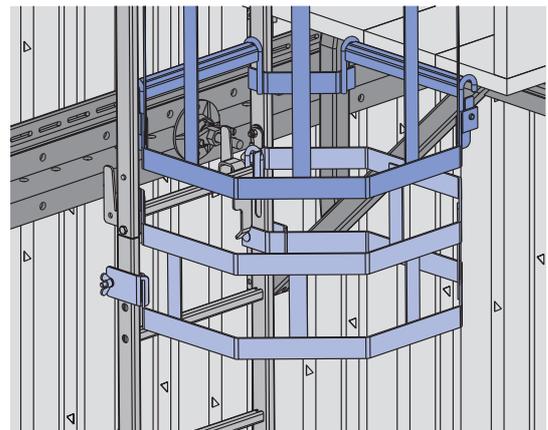
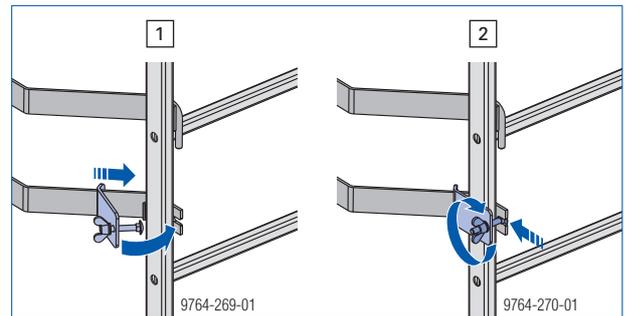
Exit onto an intermediate platform

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.



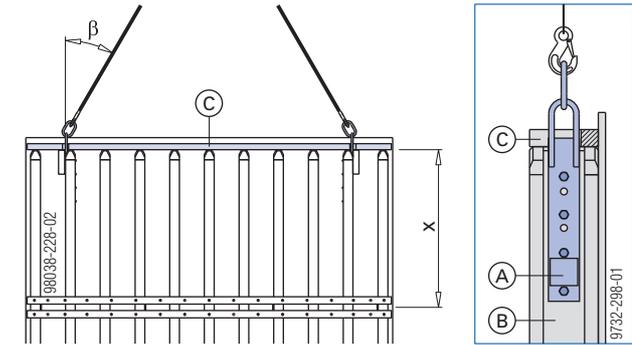
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Lifting by crane

with lifting-brackets and pressure bracing



The crane cables for lifting the elements are fastened to the lifting-brackets. These are bolted onto the webs of the Doka beams.



β ... spread-angle of slings: max. 30°

x ... max. 1.40 m

A Lifting-bracket

B Doka beam I tec 20

C Pressure bracing (plank, 4.5 x 20 cm)



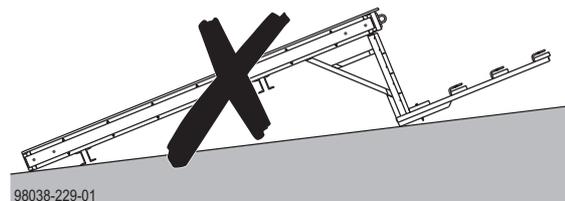
CAUTION

► It is strictly prohibited to lift the formwork without pressure bracing.

For instructions on mounting the lifting-bracket and pressure bracing (top plank), see 'Element assembly'.

For your own safety, please also 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.
- Never set down the units in such a way as to impose loads on platforms and brackets.



Max. load:

- 1300 kg per lifting-bracket (with Doka beam I tec 20)



NOTICE

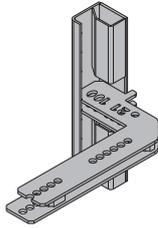
- Shore the formwork in a windproof manner when erecting it and when it is temporarily placed in the standing position.

Combining different formwork systems

Top 100 tec timber-beam formwork can be combined with the following formwork systems:

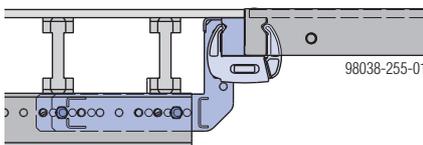
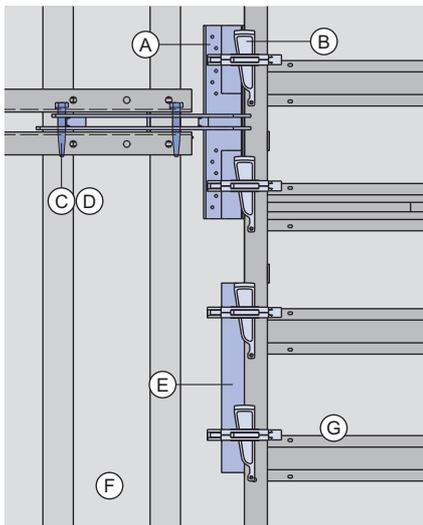
- Framax Xlife framed formwork
- Circular formwork H 20

The Top100 tec transition plate is needed for this.

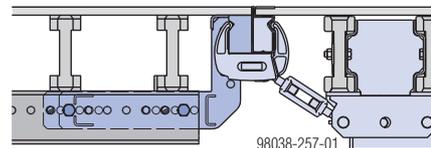
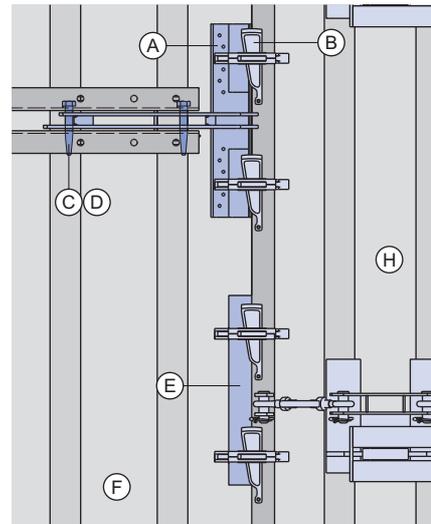


When combining this system with other Doka formwork systems, you must take their different **carrying capacities / permitted loads** into account.

Framed formwork Framax Xlife



Circular formwork H20



- A Top100 tec transition plate 21mm
- B Framax quick-acting clamp RU
- C Connecting pin 10cm
- D Spring cotter 5mm
- E Moulded timber support
- F Timber-beam formwork
- G Framed formwork Framax Xlife
- H Circular formwork H20

Wall formwork FF100 tec



Combinable with Doka wall formwork FF100 tec:

If the spacing of the walings is suitably adjusted, Top 100 tec elements can be combined with FF100 tec ready-assembled elements. This enables users to supplement the available formwork with existing FF100 tec equipment at short notice.

Enhanced requirements for fair-faced concrete

Examples of enhanced requirements:

- Architectural requirements
- Special requirements regarding planeness of the concrete surface



For more information on the topic of fair-faced concrete, please refer to the "Practical Information" brochure entitled "Forming fair-faced concrete".

Formwork sheets screwed on from rear

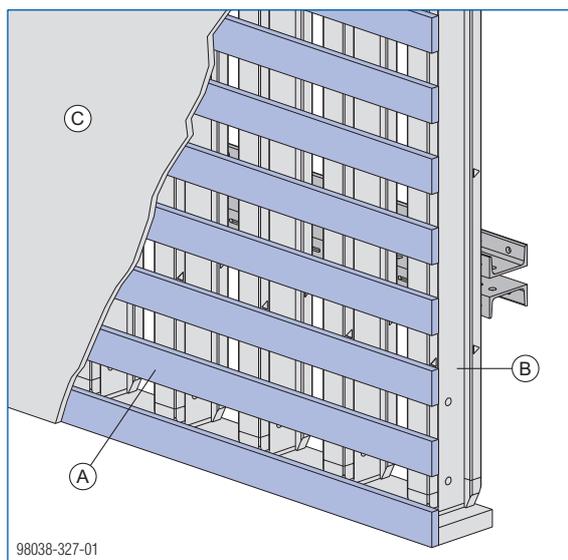
Advantages:

- High-grade concrete surfaces can be formed, without any screw imprints.
- Less finishing-work needs to be done on the concrete surfaces.
- The surfaces of the formwork sheets can easily be cleaned.

There are **two possible ways** of fixing the formwork sheets to the Doka beams:

- **Open formwork**
 - gives the elements high rigidity
 - flange-clamps can be retrofitted
 - for long construction periods
- **H20 screw-on brackets for formwork sheets**
 - no swelling
 - rentable
 - for short construction periods

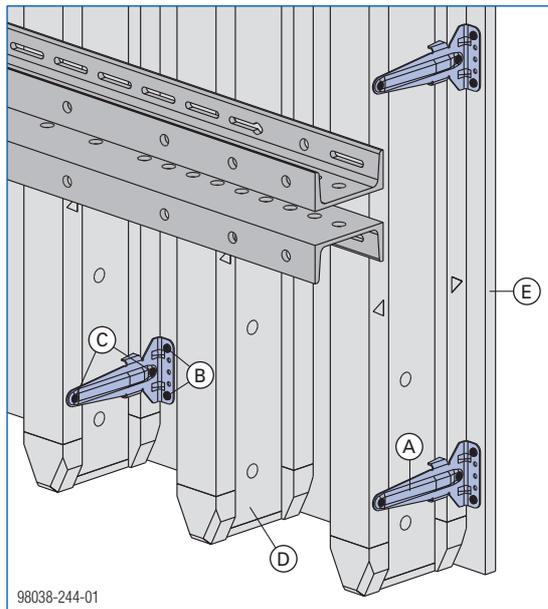
Open formwork



- A** Open formwork
- B** Beam grille
- C** Formwork sheet

H20 screw-on bracket for formwork sheets

The H20 screw-on bracket for formwork sheets makes it possible to fix formwork sheets to Doka beams from the backside.



- A** H20 screw-on bracket for formwork sheets
- B** Framax screw 6.7x20.6 (article n° 508302100)
- C** Universal countersunk-head screw Torx TG 5x50
- D** Doka beam I tec 20
- E** Formwork sheet

Advantages:

- Can be used with various different thicknesses of formwork sheet, from 18 to 27 mm.
- Can be dismantled quickly, leaving no damage.

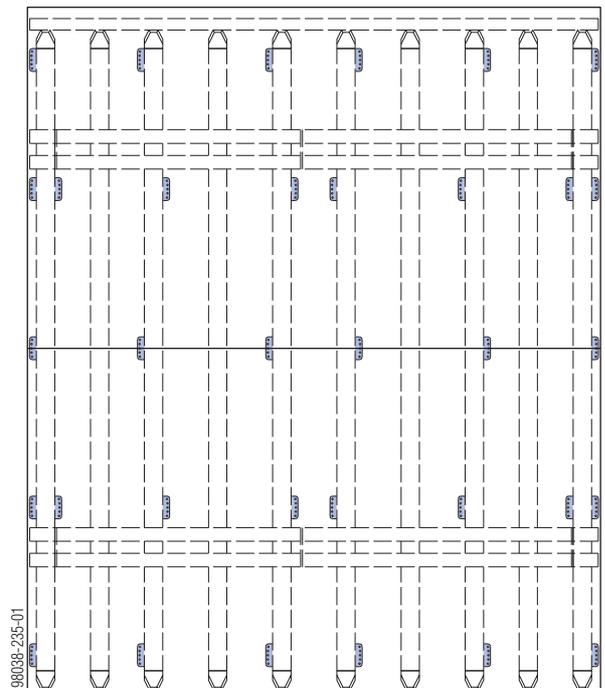


NOTICE

- On 18 mm thick sheets, the brackets can only be used together with an extra 3 mm thick packing strip (otherwise the screws might protrude on the other side of the sheet).
- While being screwed onto the H20 screw-on brackets for formwork sheets, the formwork sheet must be secured against being lifted off the beams.

Approx. five H20 screw-on brackets for formwork sheets per m² are needed for attaching the formwork sheeting.

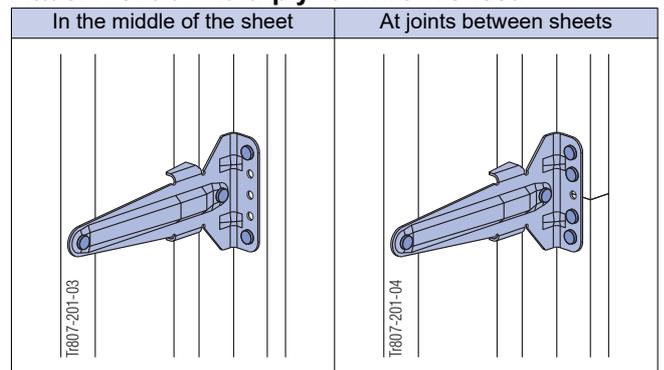
Practical example



Bolts required per H20 screw-on bracket for formwork sheets:

Type of formwork sheet	Framax screw 6.7x20.6 (on formwork sheet)	Universal countersunk-head screw Torx TG 5x50 (on formwork beam)
Multi-ply formwork sheet (Dokaplex or equivalent)	2 (In the middle of the sheet) 4 (At joints between sheets)	2
3-ply sheet (3-SO or equivalent)	4	2

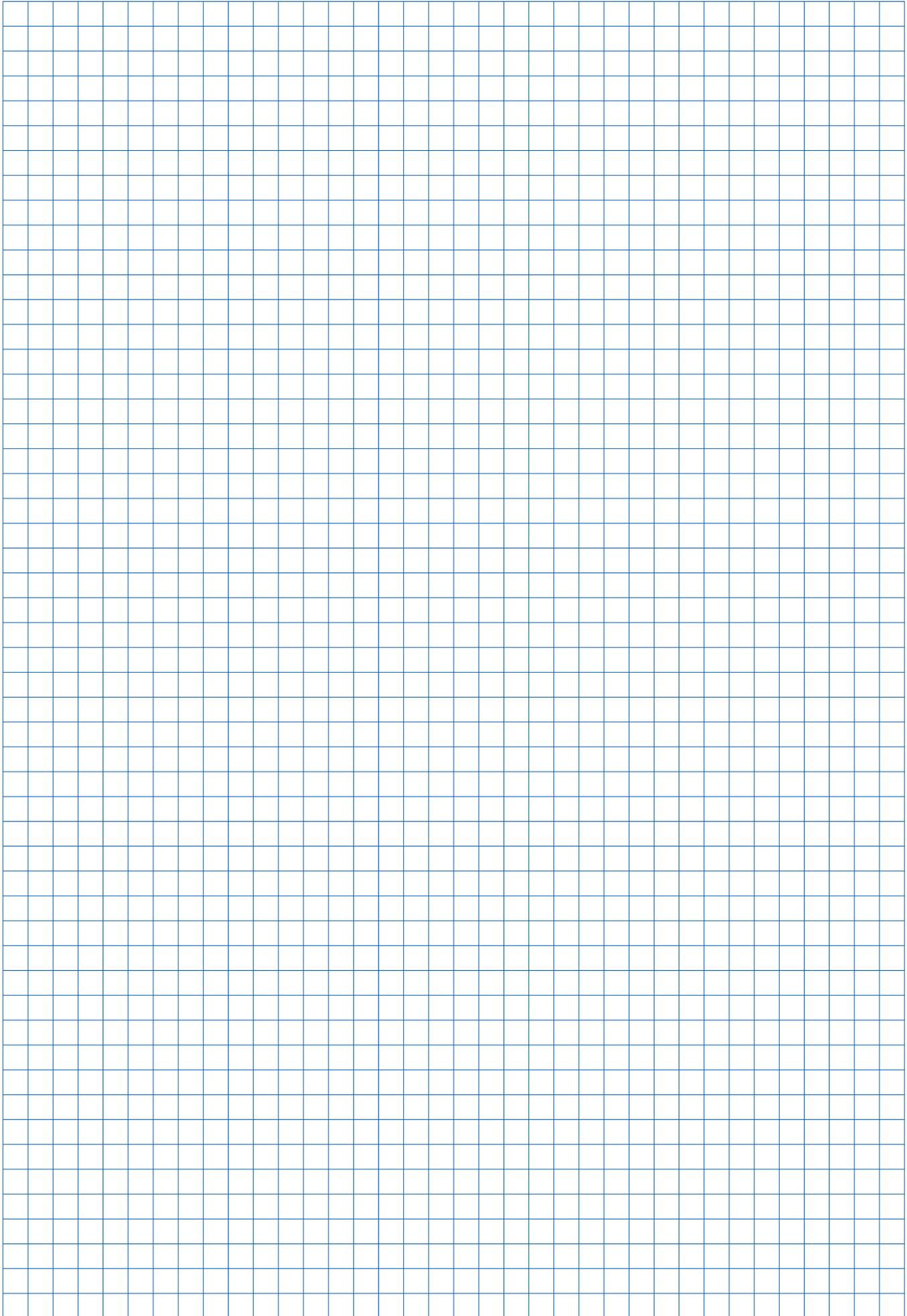
Attachment of multi-ply formwork sheet:



Permitted pull-out force per Framax screw 6.7x20.6

Type of formwork sheet	Screw-in depth	Permitted pull-out force ¹⁾
Multi-ply formwork sheet (e.g. Dokaplex 18 or 21mm)	15 mm	0.5 kN
3-ply sheet (e.g. 3-SO 21 or 27mm)	18 mm	0.2 kN

¹⁾ Values obtained when sheet was in moisture-penetrated state



Wall formwork with Platform system Xsafe plus

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.

Easy to use

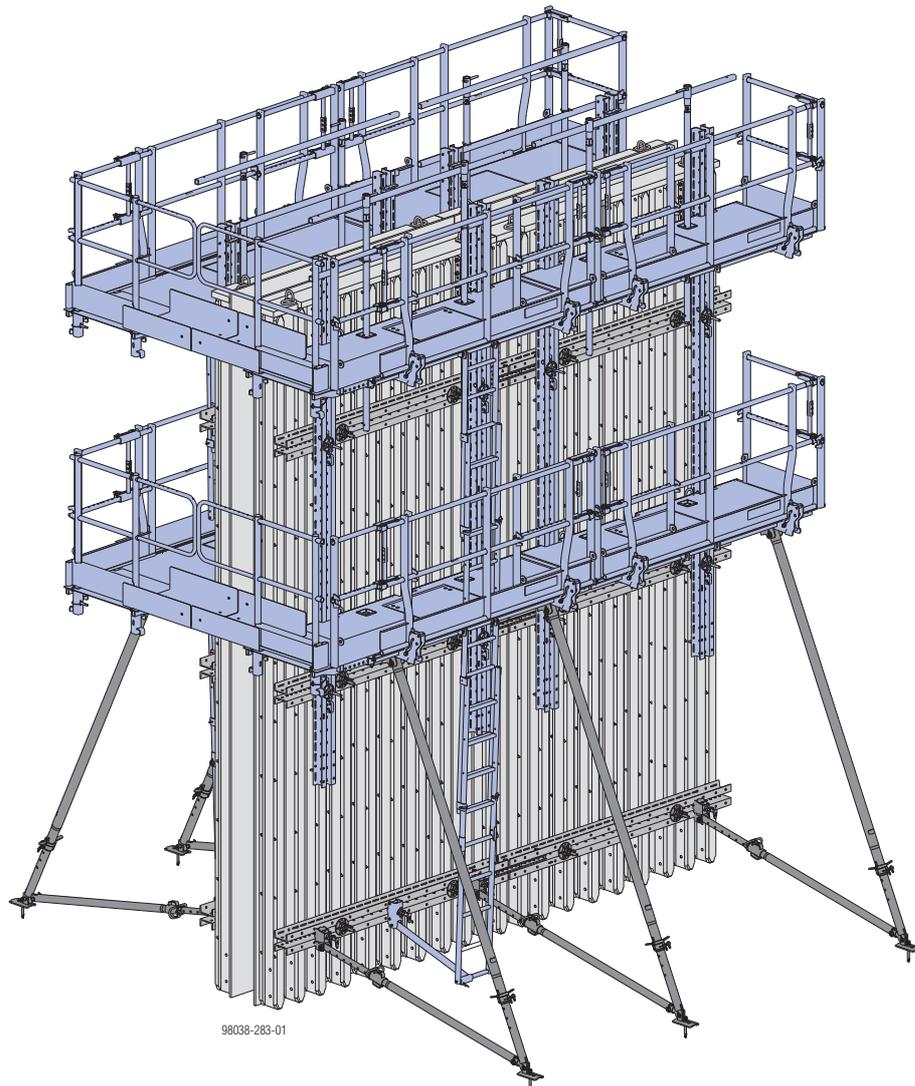
- pre-assembled, fold-out working platforms
- time and cost-savings as so little assembly work is needed
- system accessories for closure gaps and corner transitions

Safe working

- high safety, as side and end guards are integrated in the platform
- 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



NOTICE

For more information, please contact your Doka technician.

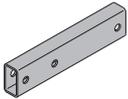
Other possible areas of use

Using Top 100 tec as bridge superstructure and tunnel formwork

The modular system of the Doka large-area formwork Top 100 tec opens up a huge range of uses - from straightforward wall formwork all the way up to tunnel formwork travellers and bridge superstructure formwork.

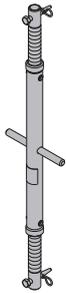
The Doka large-area formwork is adapted using the following additional components:

- **Universal support Top50** is a special plate for connecting the Top100 tec walings. It is custom-made on a project-specific basis.



- Together with the Top100 tec walings, **Universal struts Top50** and **Spindle struts** are used to make trussed bearing elements for bridges or large-area travelling formworks.

For more information, see the section headed "Struts".

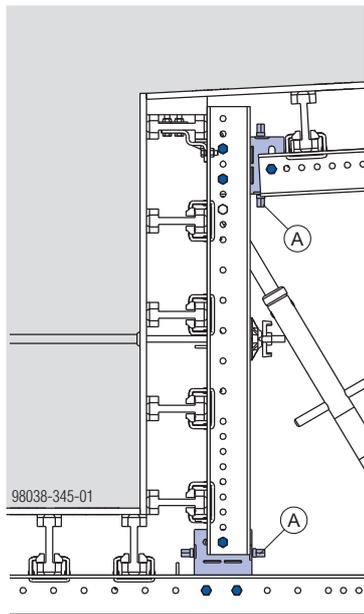


- The **T-ledge 21/42 2.00m** is a plastic ledge for covering up stripping cracks.



Adjusting plate T

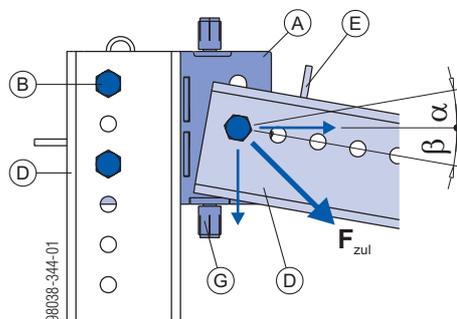
The Adjusting plate T makes it possible to set continuous height- and angle adjustments of Top 100 tec elements, e.g. in bridge superstructures.



NOTICE

Make sure that the connection plate on the Top100 tec waling WU14 does not collide with the Adjusting plate T!

Close-up of Top100 tec waling WU14



α ... max. 15°

β ... max. 20°

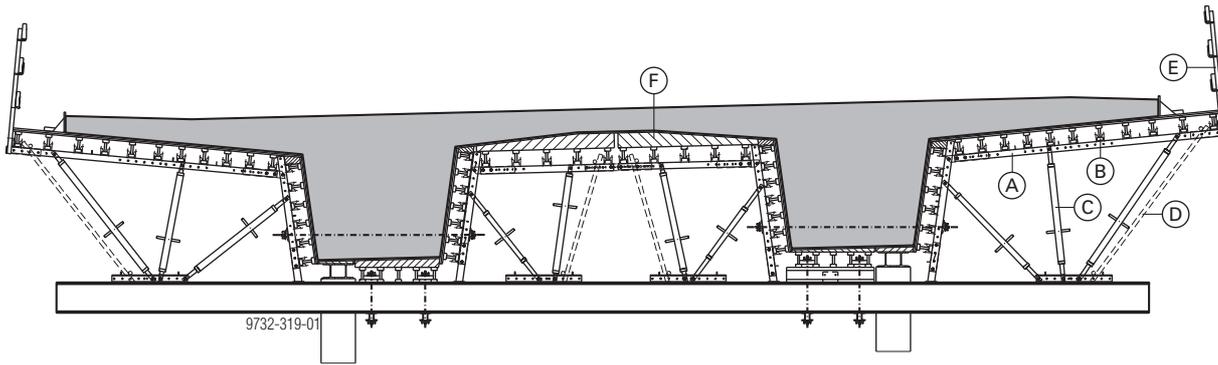
- A** Adjusting plate T
- B** Connecting pin 10cm + Spring cotter 5mm
- D** Top100 tec waling WU14
- E** Connection plate of Top100 tec waling
- G** Spindle, width-across 24 (max. adjusting range 107 mm)

$F_{\text{permissible}} = 37 \text{ kN}$

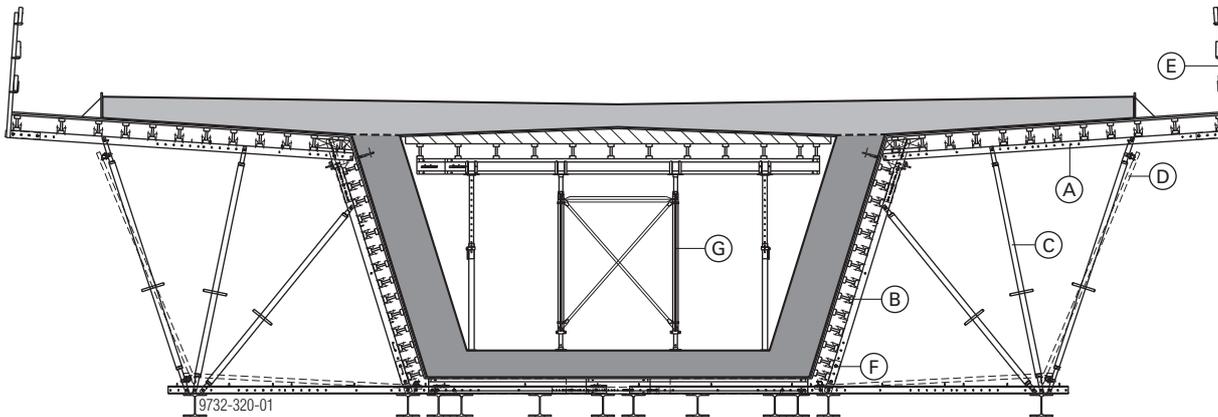
Tools needed for operating the spindle:

- Reversible ratchet 1/2"
- Box nut 24 1/2"

Bridge superstructure formwork

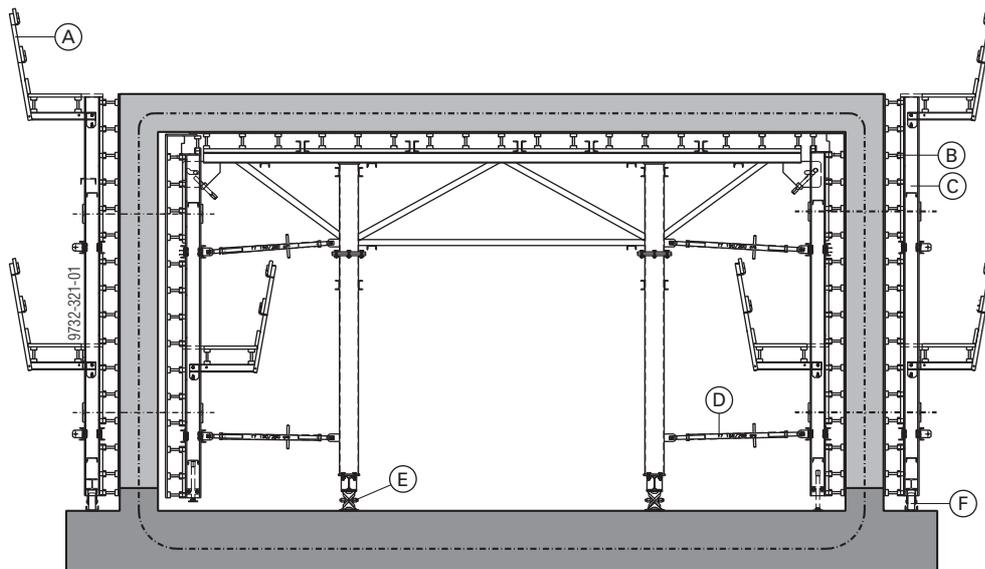


- A Top100 tec waling
- B Doka beam I tec 20
- C Spindle strut
- D Bracing
- E Handrail post T 1.80m
- F Profiled timber former



- A Top100 tec waling
- B Doka beam I tec 20
- C Spindle strut
- D Bracing
- E Handrail post T 1.80m
- F Universal support Top50
- G Doka load-bearing tower Staxo

Tunnel formwork



A Screw-on access bracket

B Doka beam I tec 20

C I-girder

D Spindle strut

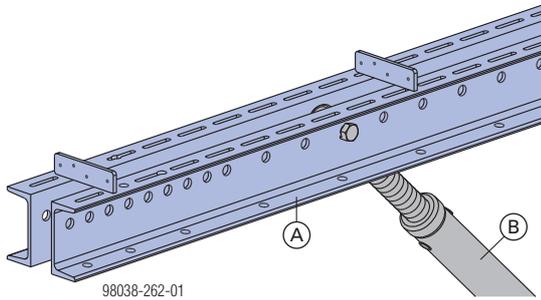
E Lowering wedge

F Armour-plated roller

Extra functions in the Top100 tec waling WU14

Practical examples

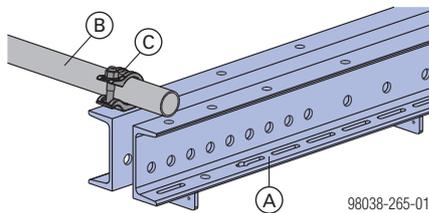
Connected to a spindle or strut along a continuous hole-grid.



A Top100 tec waling WU14

B Strut

Connected to bracing tubes by screw-on couplers

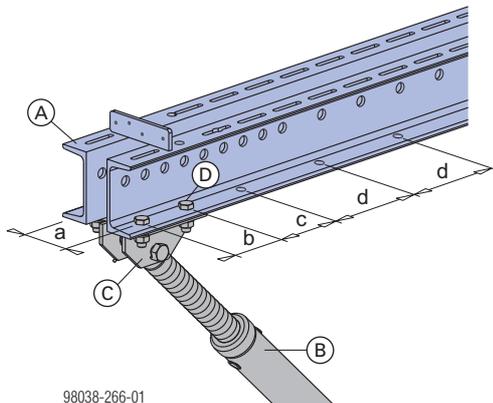


A Top100 tec waling WU14

B Scaffold tube 48.3mm

C Screw-on coupler

Connected to a spindle or strut via an adapter and the rear-located flange holes



a ... 116 \pm 2 mm

b ... 110 mm

c ... 140 mm

d ... 200 mm

Where the connection is made via a plate, allowance should be made for the axis tolerance of 116 \pm 2 mm in the transverse direction. We recommend planning for slotted holes (18x20 mm) in the transverse direction.

A Top100 tec waling WU14

B Strut

C Adapter (special component - project-specific)

D Hexagonal bolt M16x45 with hexagon nut and washer

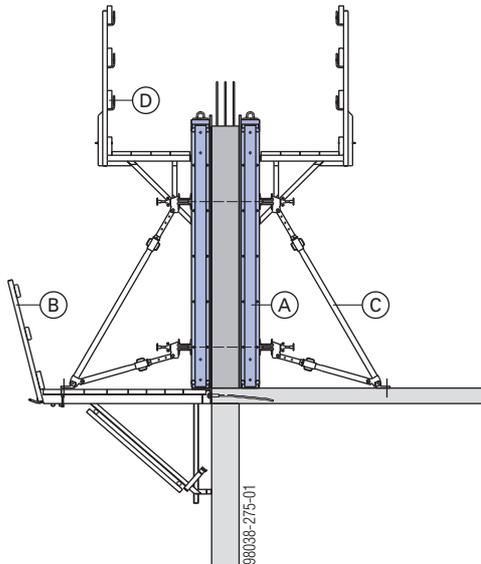
Top 100 tec combined with . . .

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 a working platform into a climbing formwork unit which can be shifted as a complete form and access-platform in one single operation.

This makes work at great heights faster and more efficient.



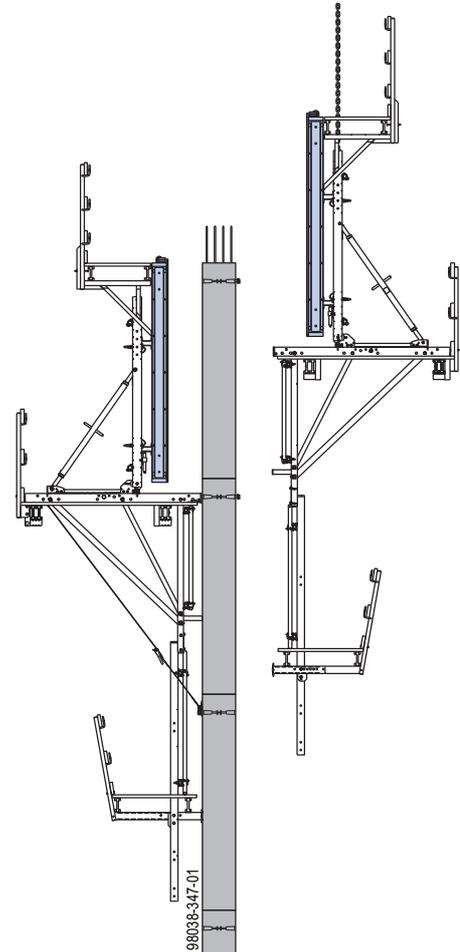
- A Top 100 tec element
- B Doka folding platform
- C Panel strut
- D Universal bracket



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

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.

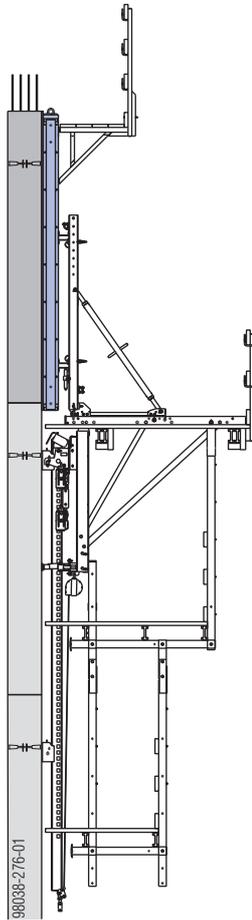


Follow the directions in the 'Climbing formwork MF240' User Information booklet!

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.

The formwork and climbing scaffold are linked together as a single unit which can be lifted and reset hydraulically.

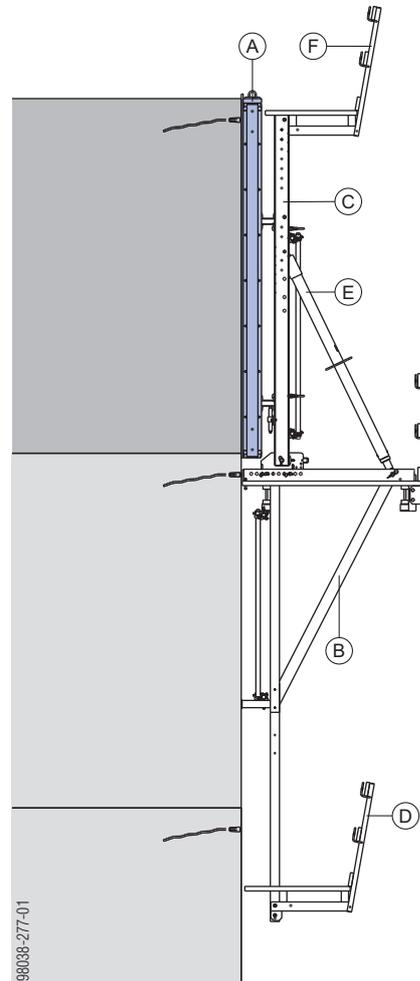


Follow the directions in the relevant User Information booklet.

Doka dam formwork

Doka dam formwork is used for building mass concrete structures that have to be constructed in several casting sections, such as dams, barrages and navigation locks etc.

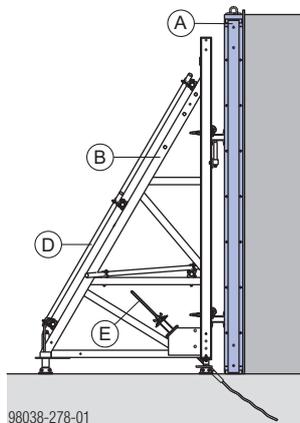
The pressure of the fresh concrete is transferred into the previous casting section by the climbing scaffold, meaning that no form-ties are needed.



- A Top 100 tec element
- B Cantilever bracket
- C Vertical waling
- D Suspended platform
- E Spindle strut
- F Screw-on access bracket MF75

Doka supporting construction frames

The **Doka supporting construct. frame Universal F** or **Doka supporting construct. frame "Variable"** also enable the sturdy elements to be used as single-sided wall formwork.



- A Top 100 tec element
- B Supporting construct. frame Universal F 4.50m
- C Attachable frame F 1.50m
- D Bracing
- E Tension anchoring



Follow the directions in the 'Supporting construction frame "Variable"' and/or 'Supporting construction frame "Universal"' User Information booklets!

Utilising self-compacting concrete

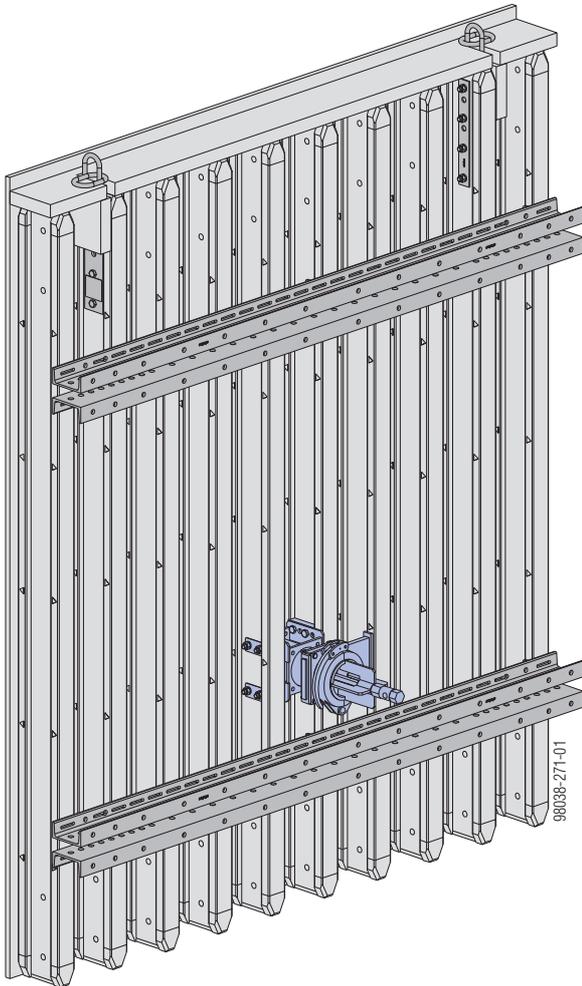
Advantages:

- Concrete is placed from below
- No vibrating needed
- Walls can be poured up against existing floor-slabs
- Little or no soiling of the formwork
- Only a small number of pouring platforms are needed

Filler neck GF SCC

The Filler neck GF SCC enables Top 50 formworks to be filled with self-compacting concrete. The concrete is pumped in and forced upward.

- Possible thickness of form-ply: 2 - 6 cm
- Required centre-to-centre spacing of the adjacent beam-pair: 26.6 cm
- Can be fitted between any pair of adjacent beams



NOTICE

For more information, please contact your Doka technician.

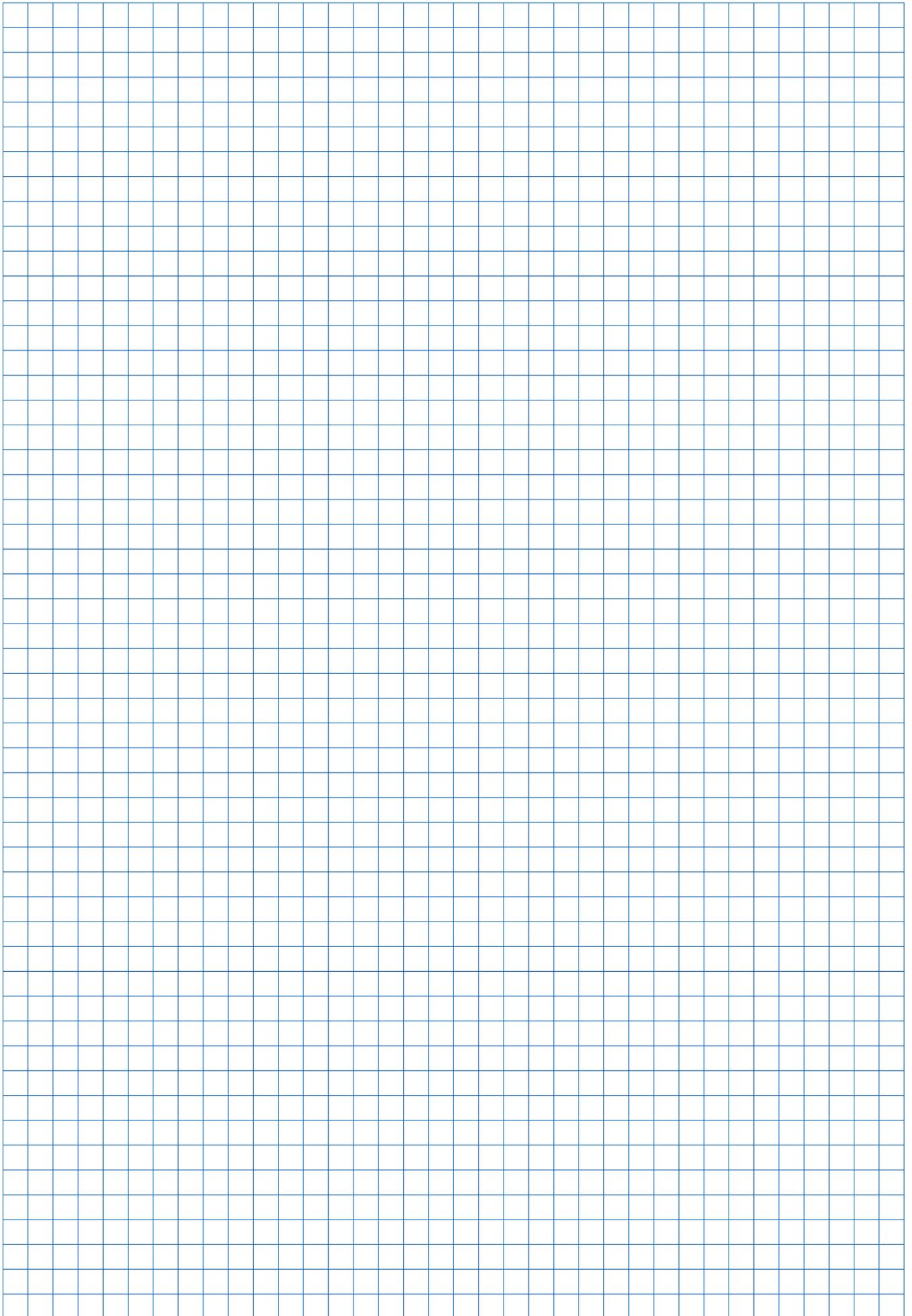
Panel closure tool D125 SCC



The Panel closure tool D125 SCC is mounted on the end of the pump hose.

Functions:

- To connect the pump hose to the Filler neck GF SCC
- To shut off the pump hose



Element assembly

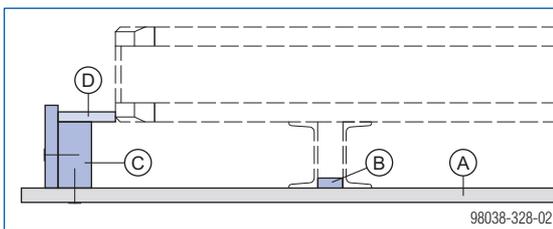
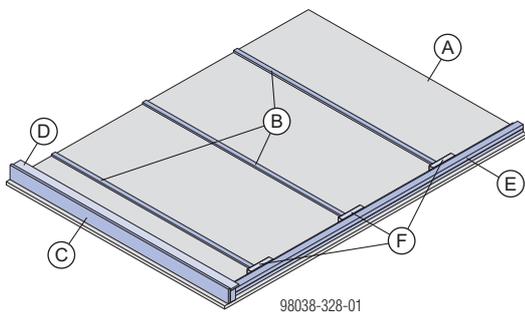
To optimise the concrete finish and to ensure that the Doka large-area formwork Top 100 tec functions at its best, the elements must be assembled correctly and precisely.

Doka beams and walings are quickly assembled into finished elements, using simple connecting devices - either on-site or by the Doka "Ready-to-Use" Service.

Assembly bench with stop bars

There must be a flat assembly bench within reach of the crane, for assembling the formwork elements on.

- ▶ Attach the end stop-bar for the Doka beams.
- ▶ Nail on the stop-bars for the Top100 tec walings (to ensure that these are correctly spaced).
- ▶ Attach the end stop-bar for the Top100 tec walings.

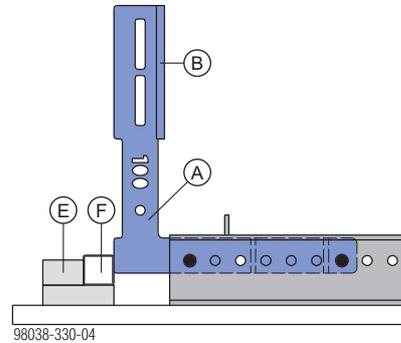


- A Assembly bench
- B Stop-bar for Top100 tec walings
- C End stop-bar for Doka beams
- D Detachable spacer batten
- E End stop-bar for Top100 tec walings
- F Shaped tube 60x60x300mm

 Removing the detachable spacer batten makes it possible to mount e.g. a bottom plank without having to move the element first.

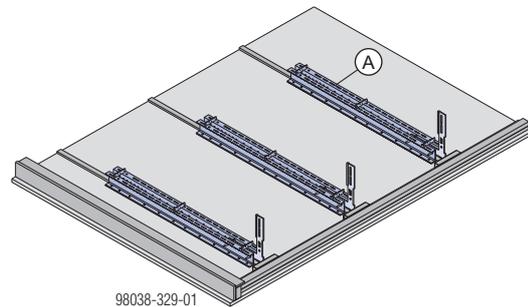
Placing the walings

- ▶ Bolt Top100 tec assembly angles to the waling. The assembly angles are used to ensure exact alignment of the Doka beams, and as stop-bars for the formwork sheets.



- A Top100 tec assembly angle
- B Stop-bar for formwork sheets
- E End stop-bar for Top100 tec walings
- F Shaped tube 60x60x300mm

- ▶ Clean the assembly bench.
- ▶ Place the Top100 tec walings, complete with the mounted assembly angles, onto the assembly bench.

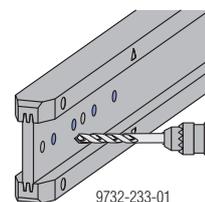


- A Top100 tec waling

 Use nails to prevent the walings sliding off.

Drilling extra holes in Doka beams

- ▶ Prepare the required number of Doka beams with such extra holes as are needed. Extra holes must be drilled for lifting brackets, Universal brackets, Top scaffold brackets and stacking-plates.



Mounting the lifting-brackets

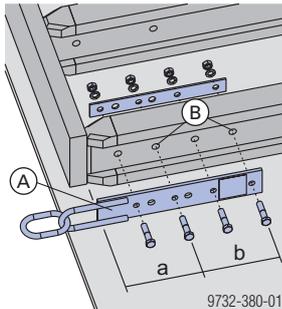


WARNING

► Doka beams which have lifting brackets mounted to them must be attached to the walings by means of threaded joints or clamps.

Simply nailing them only to the connection plate is not sufficient.

- Bolt the lifting bracket into 4 drilled holes.
Tools needed: Reversible ratchet 1/2", Box nut 24, Fork spanner 24



a ... 20.0 cm

b ... 22.4 cm

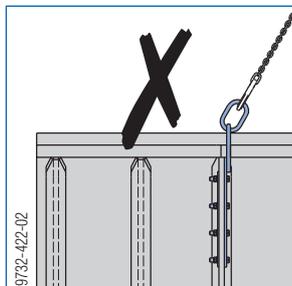
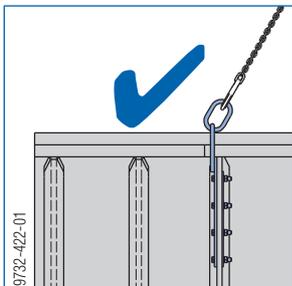
A Lifting bracket

B Extra diam. 18 mm holes



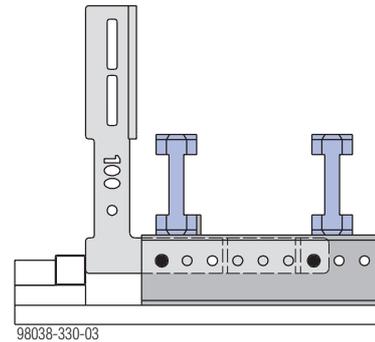
NOTICE

Be careful to ensure that the Lifting brackets are mounted in the correct position!



Placing and attaching the Doka beams

- Fasten on the Doka beams at the desired centres.



Various ways of fastening the Doka beams



NOTICE

It is not possible to fix the Doka beams I tec 20 to the Top100 tec waling WU14 with Flange clamps H20!

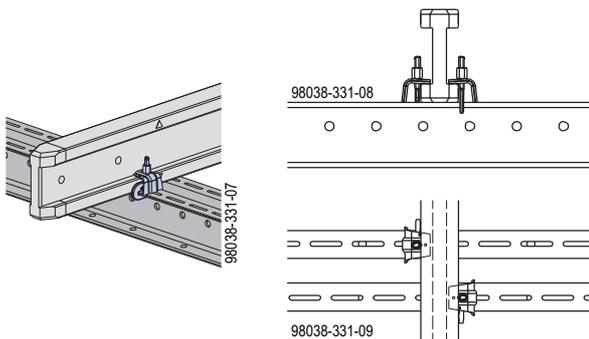
	WS10	WU12	WU14	WU16
Flange clamp H20	✓	✓	—	—
Flange clamp G	✓	✓	✓	✓
Flange claw	✓	✓	✓	✓
Fastening plate	✓	✓	✓	—
Waling clamp 2G	✓	✓	✓	—
Waling clamp H20	✓	✓	✓	—
Beam screw S 8/70	✓	✓	✓	✓
Beam screw H 8/70	✓	✓	✓	—

Waling clamp 2G

For clamping the Doka beam at any point along the waling, independently of the waling's hole-grid. Subsequent installation of beam and waling also possible.

Tools needed:

- Reversible ratchet 1/2"
- Box nut 19 1/2" L
- Extension 22cm

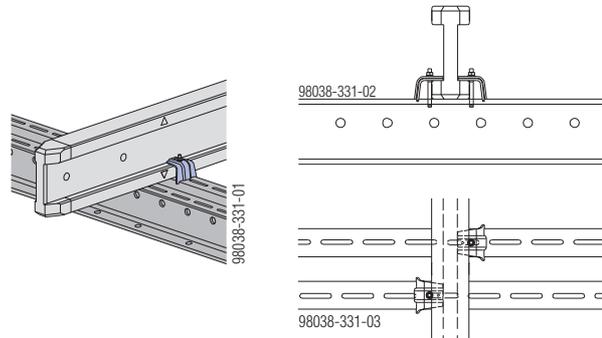


Waling clamp H20

For clamping Doka beams anywhere on the waling. Subsequent installation of beam and waling possible.

Tools needed:

- Reversible ratchet 1/2"
- Box nut 13 1/2"

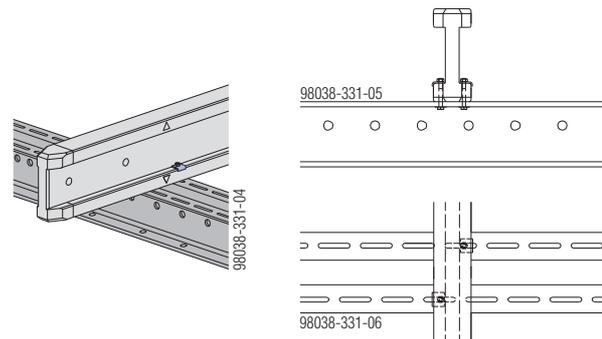


Beam screw S8/70

For screwing Doka formwork beams anywhere onto the Top100 tec waling.

Tools needed:

- Drill bit, diam. 10 mm
- Fork spanner 13/17



Beam screws H8/70

- for screwing any type of Doka beam to any point on the waling. The hammerhead is for slotting into the oblong holes in the waling.



Positioning rail with Top100 tec hole gauge

This speeds up the work of assembling the elements where beam-screws are being used between the Doka beams and the walings. The hole-gauge plates can be steplessly adjusted in line with the required spacing between the beam-screws.

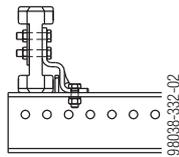
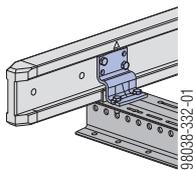
Fastening plate

For formwork elements intended for high numbers of repeat uses, or for providing stiffening reinforcement and for transferring longitudinal forces.

Can only be screwed onto the ends of the waling (in the case of walings of 1.00 m and above), to the left or right of the connection plate, in the flanges.

Tools needed:

- Drill bit, diam. 17 mm
- Reversible ratchet 1/2"
- Box nut 24 1/2"
- Fork spanner 24



Double-headed nails 80mm



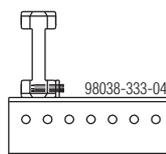
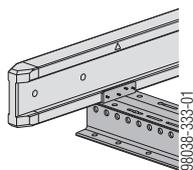
WARNING

▶ Doka beams which have lifting-brackets mounted to them must be attached to the Top100 tec walings by means of threaded joints or flange-clamps.

Simply nailing them only to the Connection plate is not sufficient.

The connection plates serve as stop-bars for the edge beams and can also be used for fixing the beams in place.

Fasten the Doka beam to the connection plate with 4 double-headed nails.



Flange-clamp G

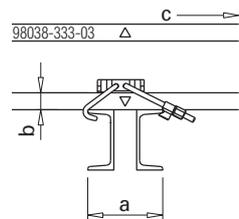
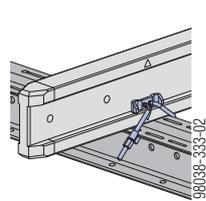
For fastening the Doka beam anywhere on the waling. Can also be used on steel girders such as I-girders etc.

Note:

First push the flange-clamps onto the Doka beam, and only then place the Doka beam onto the waling.

Tools needed:

- Reversible ratchet 1/2"
- Box nut 19 1/2" L



c ... bottom of formwork

Clamping ranges [cm]

b	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
a _{min}	15.8	15.8	15.0	14.5	13.4	13.2	13.0	13.0	12.8
a _{max}	23.8	23.3	23.2	22.7	22.3	21.9	21.3	20.7	20.0

Clamping ranges [cm]

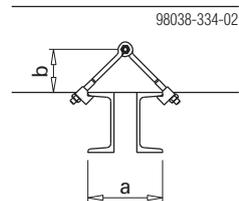
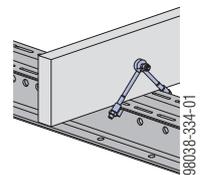
b	4.5	5.0	5.5	6.0
a _{min}	12.3	11.5	11.8	12.0
a _{max}	19.3	18.2	16.8	14.6

Flange claw

Also for subsequent fastening of Doka beams or squared timbers to any position on walings and (IPB-section) steel girders.

Tools needed:

- Drill bit, diam. 17 mm
- Reversible ratchet 1/2"
- Box nut 19 1/2" L



Clamping ranges [cm]

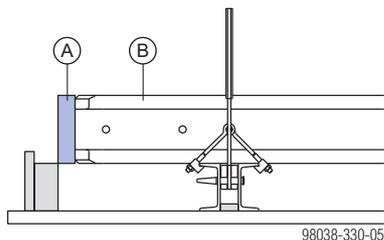
b	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
a _{min}	17.3	17.1	17.0	16.7	16.3	16.0	15.5	14.8	14.2
a _{max}	29.0	28.9	28.8	28.7	28.6	28.4	28.1	27.7	27.4

Clamping ranges [cm]

b	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
a _{min}	13.4	12.5	11.4	10.1	10.0	10.0	10.0	10.0	10.0
a _{max}	27.1	26.7	26.0	25.5	25.1	24.4	23.7	23.0	22.2

Mounting a bottom plank

- Remove the detachable spacer batten from the assembly bench.
- Fasten the bottom plank to each beam-flange using a 3.1x90 nail.



- A Bottom plank
- B Doka beam

Mounting the top plank (pressure bracing)

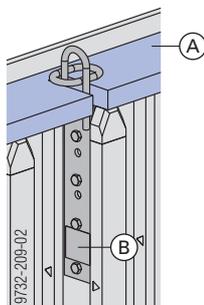


CAUTION

- There must always be a pressure bracing between the Lifting brackets.
- The gap between the two Lifting brackets must be firmly braced, without any play, to prevent any oblique pull being applied to the Doka beams.

This means that the recesses must be profiled very precisely into the web of the beam.

- Fasten the top plank (pressure bracing) to each beam-flange using a 3.1x90 nail.

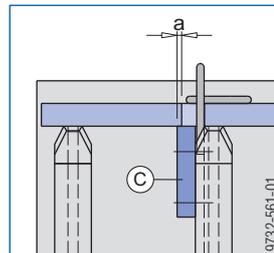


- A Top plank (pressure bracing)
- B Lifting-bracket



CAUTION

- If the lifting-bracket is mounted on the 2nd beam from the outside, the top plank must be supported where it has been recessed.
- Nail a supporting board onto the formwork beam.

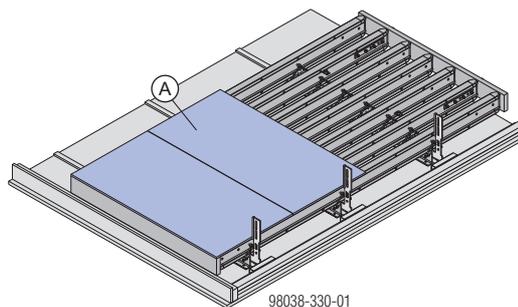


a ... min. 10 mm (minimum support surface)

- C e.g. 200x200 mm board

Fixing the formwork sheets

- Place the formwork sheets up against the assembly angles and nail them onto each Doka beam. Make sure that the grain of the face layer runs at right angles to the supports (i.e. to the Doka beams).



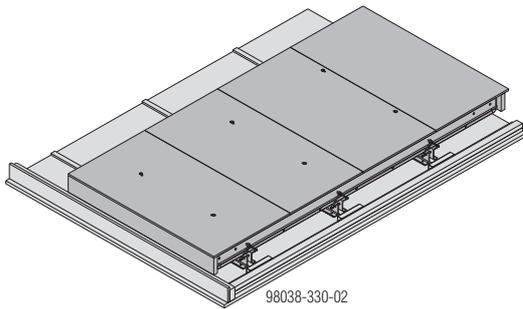
- A Doka formwork sheet



The Strip tensioner B 6.00m presses the joints between the sheets tightly together prior to fixing.

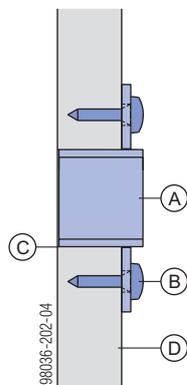
Drilling the form-tie holes

- ▶ Drill as specified in the formwork plan.
Tie-rod system 20.0: diam. 24 mm
- ▶ Seal cut edges, and around holes, with edge varnish.



Tie-hole protector 20.0

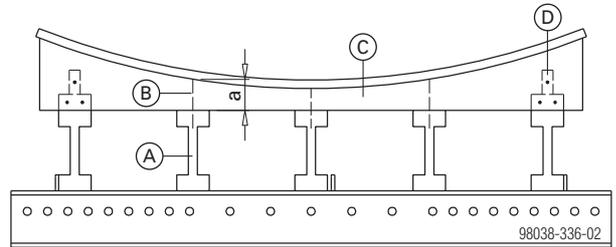
In order to fit the Form-ply protector, a 35 mm diameter hole must be drilled in the form-ply first.



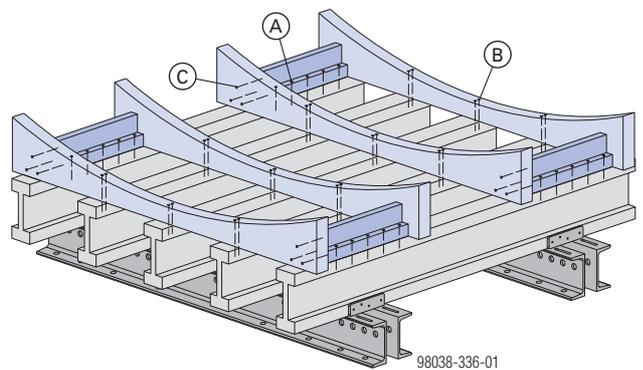
- A Tie-hole protector 20.0
- B Framax screw 7x22 (4 in all)
- C Silicone
- D Formwork sheet 21mm

Mounting profiled timber formers

Up to a max. nailing thickness (**a**) of 5.0 cm, the profiled timber formers can be nailed directly onto the beam. Where the profiled timber formers are thicker than this, they are nailed from the side through blocks screwed onto the beams. These 'beam-blocks' also prevent the profiled timber formers from tipping over on their sides. The blocks are cut to size from used Doka beams.



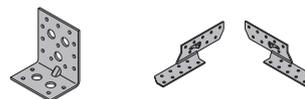
- A Doka beam
- B Nailed joint
- C Profiled timber former
- D Beam block

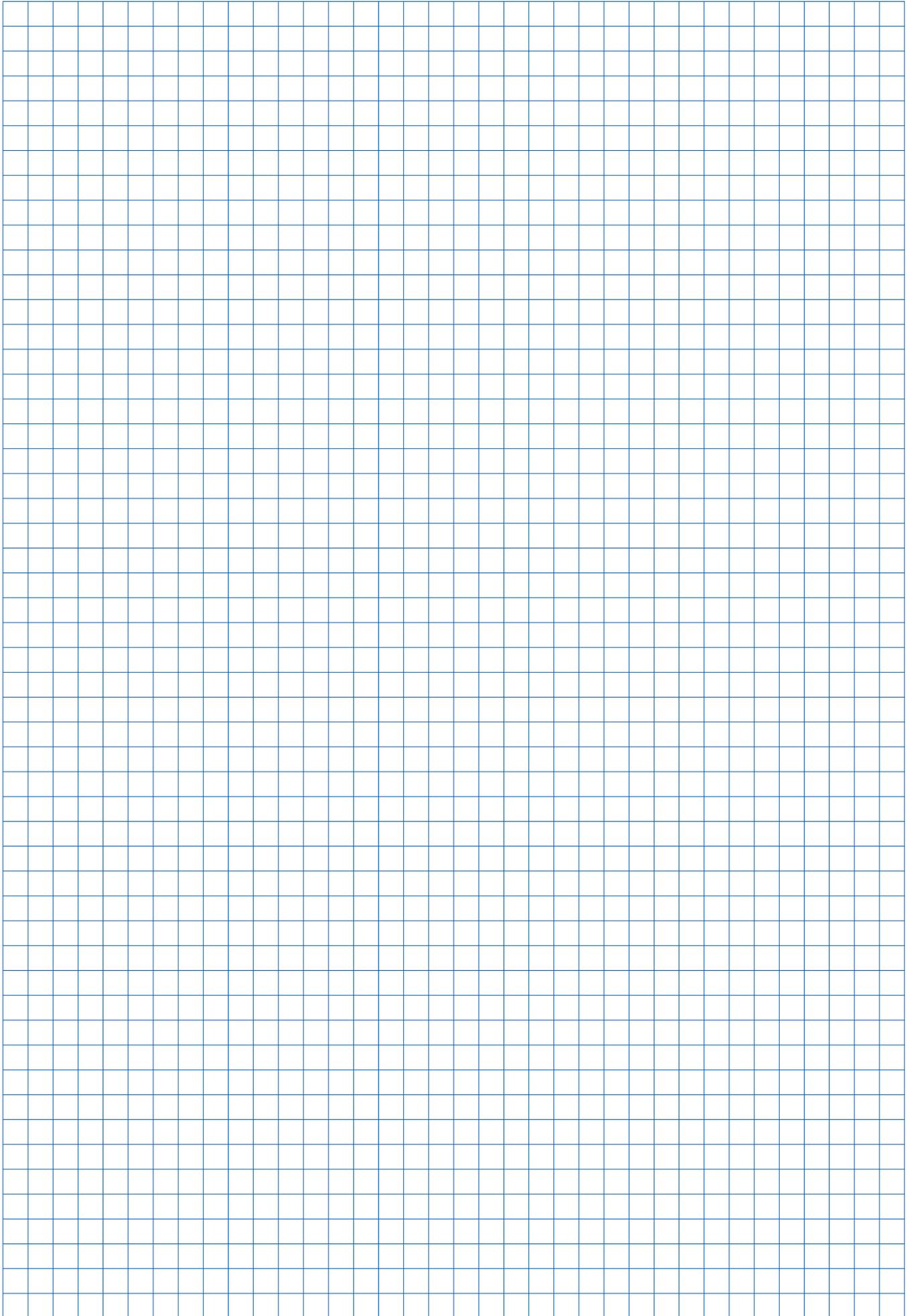


- A Beam block screwed onto Doka beam
- B Profiled timber former nailed onto Doka beam
- C Profiled timber former nailed onto beam-block

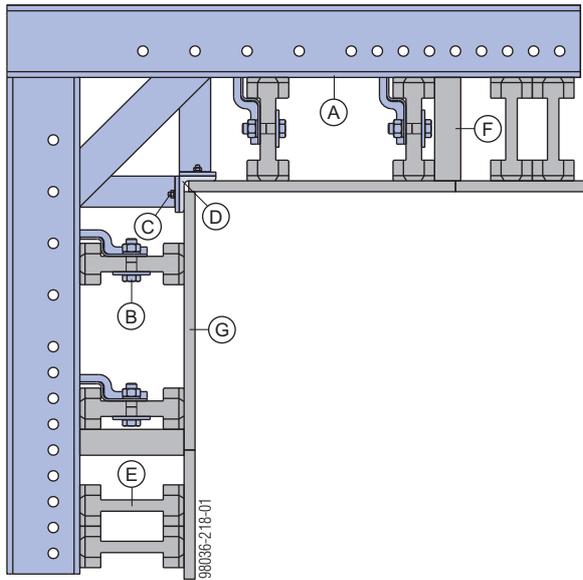
Angle connector 9x5cm and Rafter plates right / left

Can be used for various timber joints such as Doka beams that cross over one another, or joints between Doka beams and squared timbers or profiled timber formers.



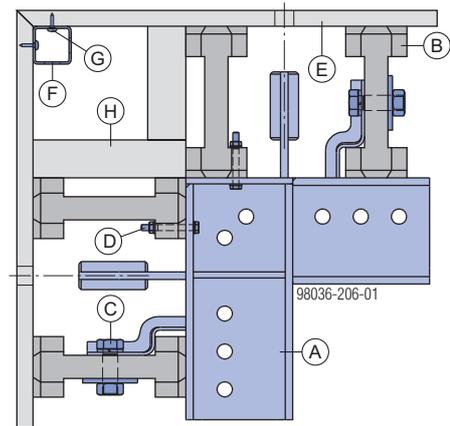


Mounting the outside corner with the Top100 tec outside corner waling



- A** Top100 tec outside corner waling (incl. nuts & bolts etc.)
- B** Hexagon bolt M20x70
Spring washer A20
Washer R22
Hexagon nut M20
- C** Countersunk bolt M8x30
Hexagon nut M8
Washer A8
- D** L-section 70x70x9 mm (site-provided, length project-specific)
- E** Doka beam I tec 20
- F** Plank
- G** Doka formwork sheet

Mounting the inside corner with the Top100 tec inside corner waling



- A** Top100 tec inside corner waling
- B** Doka beam I tec 20
- C** Hexagon bolt M20x60
Spring washer A20
Washer R22
Hexagon nut M20
- D** Hexagon bolt M8x70
Hexagon nut M8
Washer 8
- E** Doka formwork sheet
- F** Top100 tec corner profile or squared timber
- G** Framax screw 7x22
- H** Plank

Structural design

Top100 tec waling WU14



NOTICE

This table refers only to one single element with 2 cantilever arms.

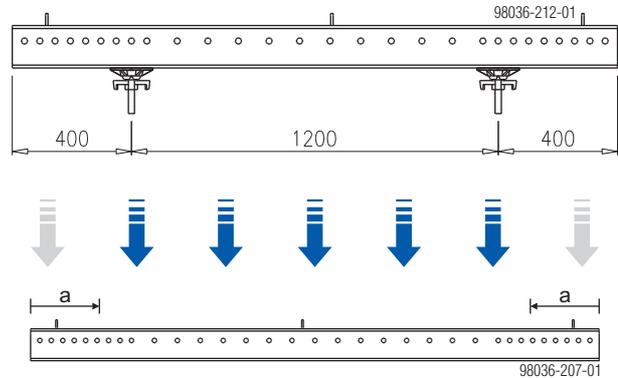
It takes no account of:

- continuity effects with other elements
- combinations of elements
- closures
- stop-ends etc.

Length [m]	Number of ties	Spacing of form-ties on standard elements [mm]	Permitted waling load [kN/m]	Characteristic anchor force [kN]
0.50	1	250 - 250	516	258
0.75	2	200 - 350 - 200	695	261
	1	375 - 375	281	211
1.00	2	250 - 500 - 250	515	258
	1	500 - 500	181	181
1.25	2	250 - 750 - 250	380	238
	1	625 - 625	119	149
1.50	2	300 - 900 - 300	309	232
	1	750 - 750	83	125
1.75	2	300 - 1150 - 300	194	170
2.00	2	400 - 1200 - 400	217	217
	2	450 - 1100 - 450	203	203
	2	500 - 1000 - 500	182	182
	2	525 - 950 - 525	166	166
2.50	2	450 - 1600 - 450	107	134
	2	500 - 1500 - 500	149	186
	2	550 - 1400 - 550	144	180
	3	360 - 890 - 890 - 360	278	249
3.00	3	450 - 1050 - 1050 - 450	205	210
	3	500 - 1000 - 1000 - 500	176	187
	3	550 - 950 - 950 - 550	150	172
3.50	2	625 - 1750 - 625	113	170
	3	450 - 1300 - 1300 - 450	138	192
	3	500 - 1250 - 1250 - 500	163	206
4.00	3	550 - 1200 - 1200 - 550	148	176
	4	450 - 1030 - 1040 - 1030 - 450	206	210
	4	500 - 1000 - 1000 - 1000 - 500	177	186
4.50	4	550 - 1000 - 900 - 1000 - 550	150	171
	4	450 - 1200 - 1200 - 1200 - 450	171	208
	4	500 - 1150 - 1200 - 1150 - 500	174	203
5.00	4	550 - 1120 - 1160 - 1120 - 550	150	173
	4	450 - 1400 - 1300 - 1400 - 450	134	187
	4	500 - 1340 - 1320 - 1340 - 500	144	194
5.50	4	550 - 1325 - 1250 - 1325 - 550	146	186
	5	450 - 1150 - 1150 - 1150 - 450	186	216
	5	500 - 1150 - 1100 - 1100 - 500	173	191
6.00	5	550 - 1050 - 1150 - 1150 - 550	150	183
	5	450 - 1250 - 1300 - 1300 - 450	153	201
	5	500 - 1250 - 1250 - 1250 - 500	164	206
	5	550 - 1250 - 1200 - 1200 - 550	147	176

Practical example:

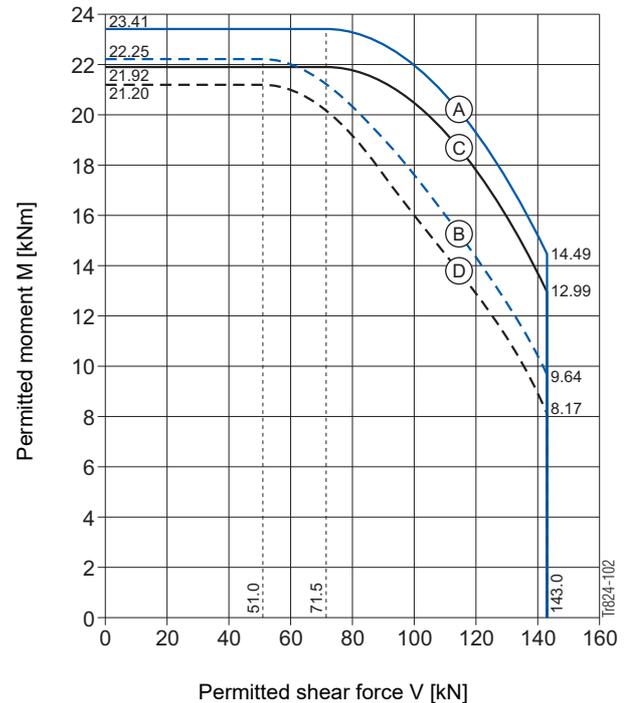
400-1200-400 tie-spacing in a Top100 tec waling WU14 2.00m



a ... 30 cm

	Middle zone	End zone 'a'
Permitted moment M [kNm]	23.4	21.9
Permitted shear force V [kN]	143	143
Permitted normal force N [kN] ¹⁾	462	442
Moment of inertia [cm ⁴]	1210	1210

Interaction diagram



- A** Middle zone $N_k = 0 \text{ kN}^1)$
- B** Middle zone $N_k = 70 \text{ kN}^1)$
- C** End zone $N_k = 0 \text{ kN}^1)$
- D** End zone $N_k = 70 \text{ kN}^1)$

¹⁾ without proof of stability

Doka beam I tec 20



NOTICE

Dimensioning of the form-ply must be carried out separately.

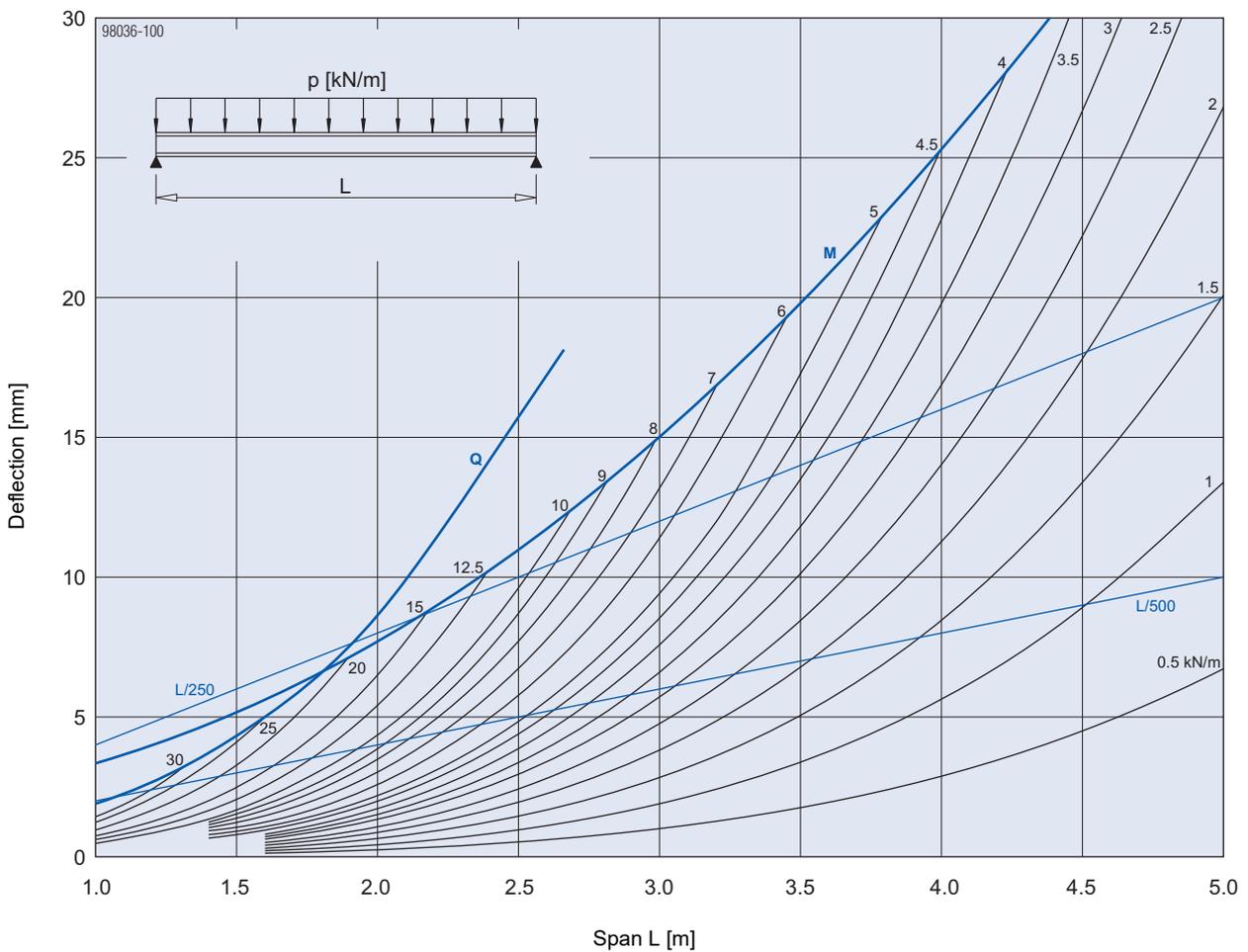
We recommend high-grade birch plywood sheets or Doka formwork sheets 3-SO or 3-S plus.



98036-101

Technical data:

- Permitted bending moment: 9 kNm
- Permitted shear force: 20 kN
- Rigidity: 640 kNm²
- Weight: 5.6 kg/lin.m



M ... permitted bending moment
 Q ... permitted shear force
 p ... actual load (service load)

Doka formwork sheets

All values in the diagrams are based on a wood moisture content of 20%. If the moisture levels are higher than this, two effects will occur: The modulus of elasticity will greatly decrease (i.e. deformation will increase), and the strength values will be lower. This leads to a reduction in the load-bearing capacity.

Dokoplex formwork sheets

Note:

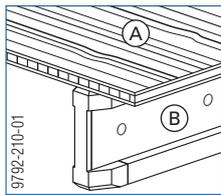
The grain of the face layer can be arranged in any direction relative to the supports.

Doka formwork sheets 3-SO

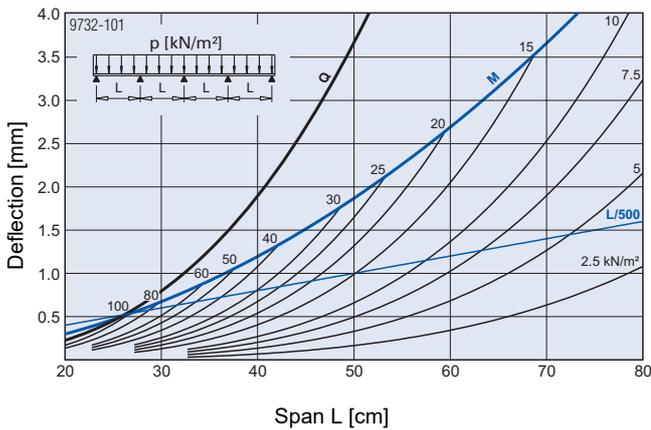


NOTICE

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

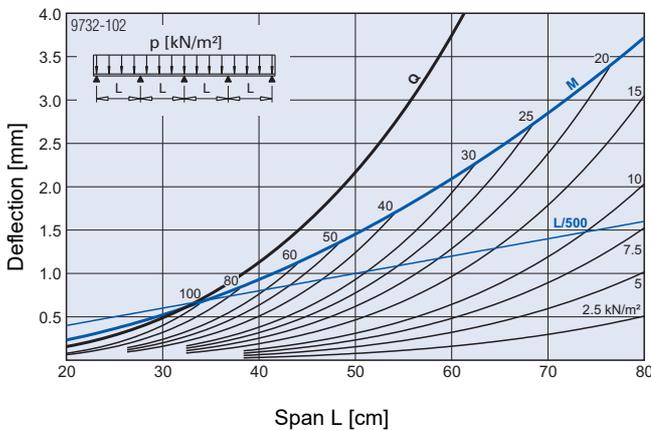


21 mm



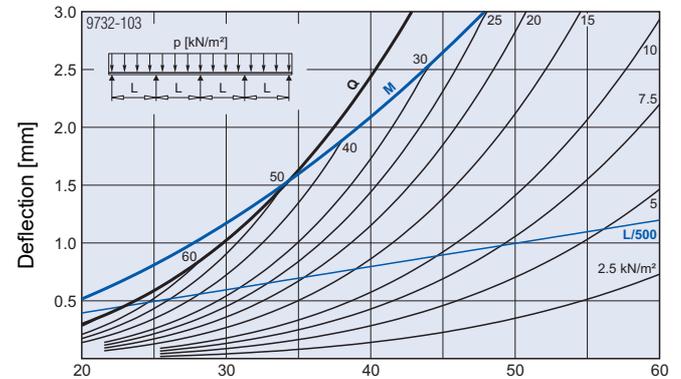
Flexural stiffness $EI = 7.82 \text{ kNm}^2/\text{m}$ (15% timber moisture content)
 M ... permitted bending moment
 Q ... permitted shear force

27 mm



Flexural stiffness $EI = 15.4 \text{ kNm}^2/\text{m}$ (15% timber moisture content)
 M ... permitted bending moment
 Q ... permitted shear force

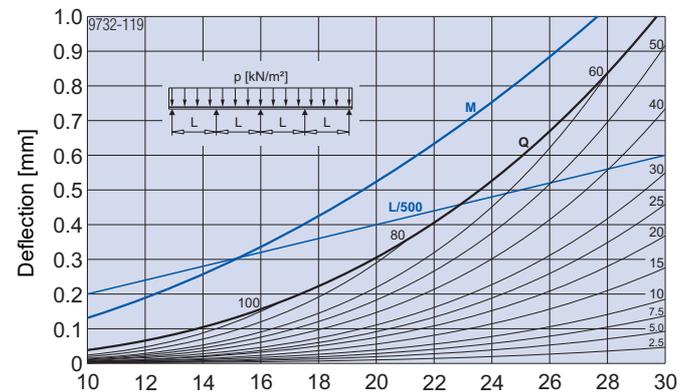
18 mm



Span L [cm]

Flexural stiffness $EI = 3.1 \text{ kNm}^2/\text{m}$ (15% timber moisture content)
 M ... permitted bending moment
 Q ... permitted shear force

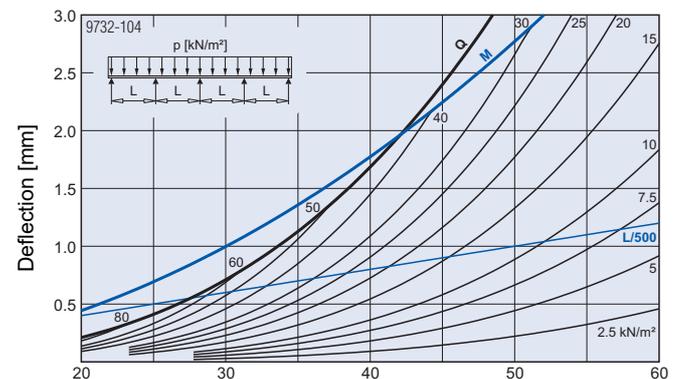
18 mm - detailed view



Span L [cm]

Flexural stiffness $EI = 3.1 \text{ kNm}^2/\text{m}$ (15% timber moisture content)
 M ... permitted bending moment
 Q ... permitted shear force

21 mm



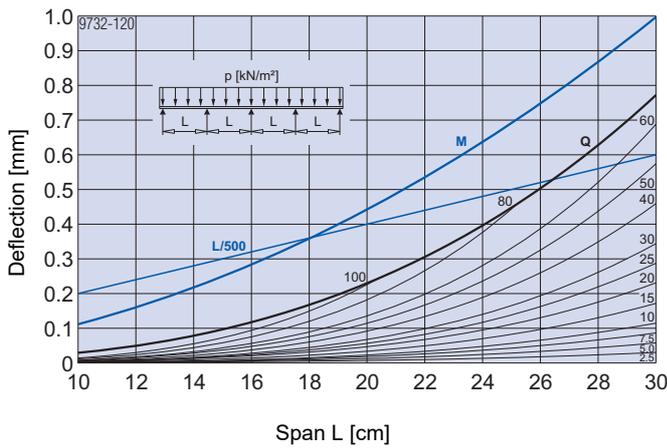
Span L [cm]

Flexural stiffness $EI = 4.7 \text{ kNm}^2/\text{m}$ (15% timber moisture content)

M ... permitted bending moment

Q ... permitted shear force

21 mm - detailed view



Flexural stiffness $EI = 4.7 \text{ kNm}^2/\text{m}$ (15% timber moisture content)

M ... permitted bending moment

Q ... permitted shear force

9 mm

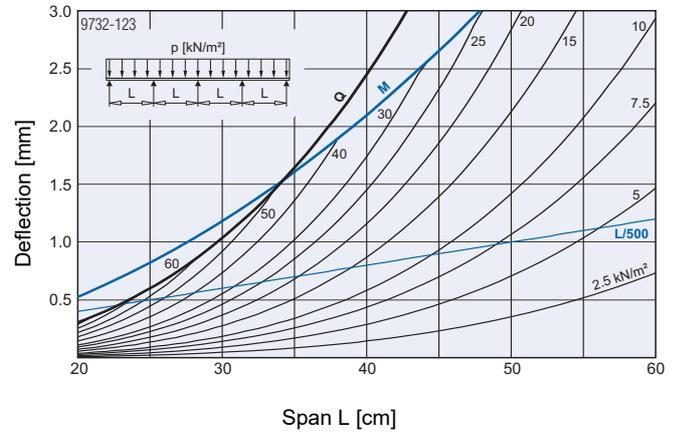
The Dokaplex formwork sheet 9mm is only used for facing profiled timber formers, e.g. as a simple way of forming curved surfaces.

DokaPly Birch

Note:

The grain of the face layer can be arranged in any direction relative to the supports.

18 mm

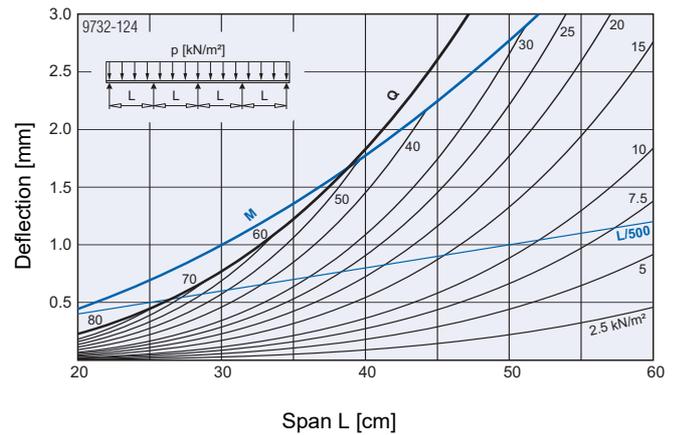


Flexural stiffness $EI = 3.0 \text{ kNm}^2/\text{m}$ (15% timber moisture content)

M ... permitted bending moment

Q ... permitted shear force

21 mm



Flexural stiffness $EI = 4.9 \text{ kNm}^2/\text{m}$ (15% timber moisture content)

M ... permitted bending moment

Q ... permitted shear force

Xlife sheets 21mm

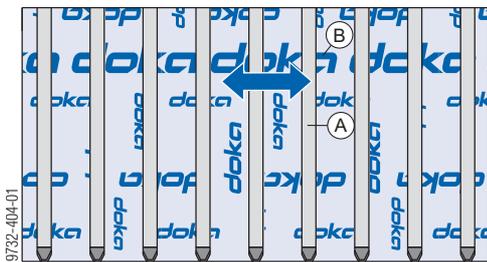


NOTICE

The deflection characteristics of the Xlife sheet in the longitudinal are different from those in the transverse direction. The only way to tell which is the longitudinal and which is the transverse direction is by the direction of the lettering on the formwork sheets.

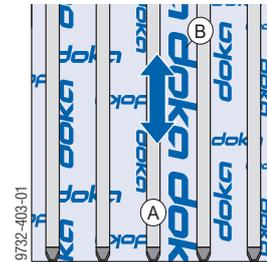
For the purpose of the following diagrams, then, be sure to know which way round the Xlife sheets are placed in relation to the supports (e.g. Doka beams).

Large Doka logos of the sheet lettering at right angles to the beam axis (Xlife sheet longside horizontal)

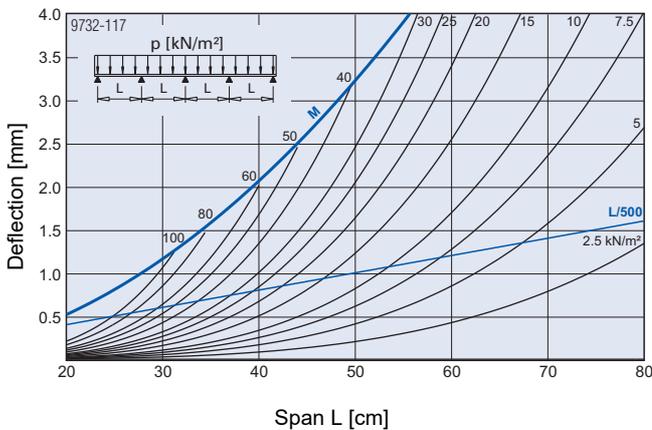


- A Support
- B Sheet lettering (large Doka logos)

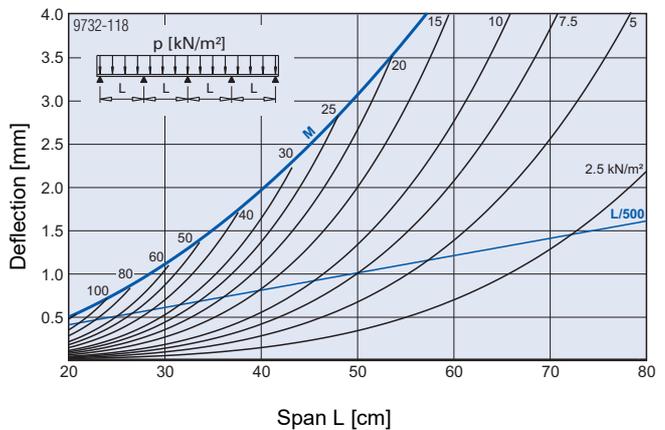
Large Doka logos of the sheet lettering parallel to the beam axis (Xlife sheet longside vertical)



- A Support
- B Sheet lettering (large Doka logos)



M ... permitted bending moment



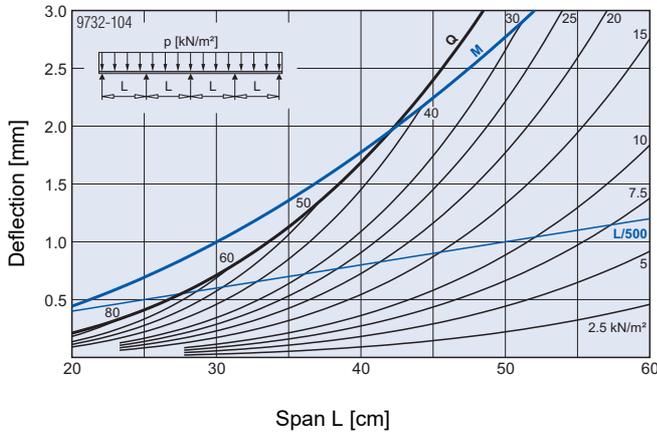
M ... permitted bending moment

Xface sheets 21 mm

Note:

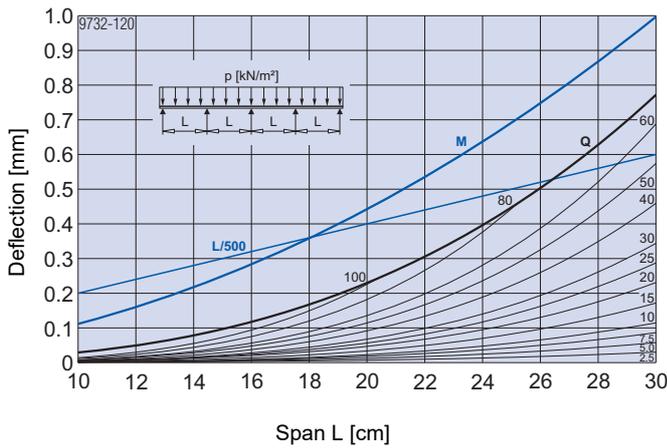
The grain of the face layer can be arranged in any direction relative to the supports.

21 mm



Flexural stiffness $EI = 4.7 \text{ kNm}^2/\text{m}$ (15% timber moisture content)
 M ... permitted bending moment
 Q ... permitted shear force

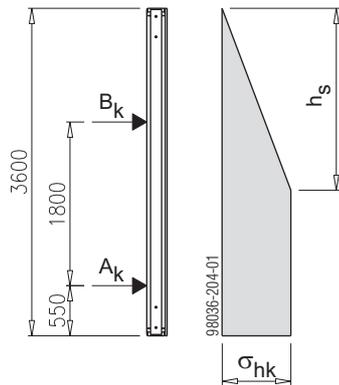
21 mm - detailed view



Flexural stiffness $EI = 4.7 \text{ kNm}^2/\text{m}$ (15% timber moisture content)
 M ... permitted bending moment
 Q ... permitted shear force

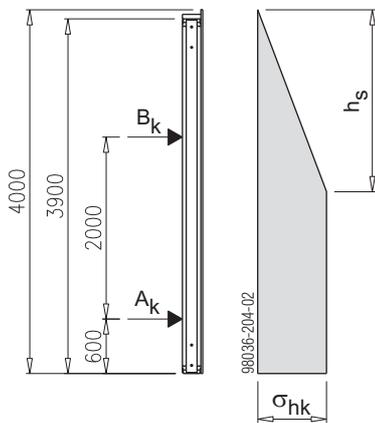
Top100 tec elements

Formwork height 3.60 m



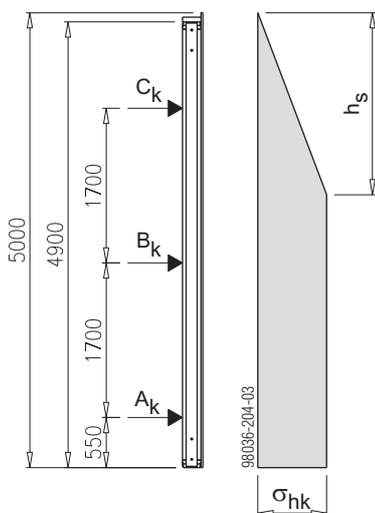
Permitted fresh-concrete pressure σ_{hk} [kN/m ²]	30	40	50	60	70	80	90	100
Beam centres [cm]	68	55	45	39	35	34	34	
Cantilever deflection at top [mm]	1.2	-0.9	-1.8	-1.9	-1.6	-1.3	-1.2	
Max. span deflection [mm]	1.5	2.0	2.1	2.0	1.8	1.6	1.5	
Cantilever deflection at bottom [mm]	-0.8	-1.2	-1.3	-1.2	-0.9	-0.6	-0.4	
Waling load B_k [kN/m]	48.5	55.3	58.8	60.0	59.8	59.0	58.5	
Waling load A_k [kN/m]	41.5	56.7	71.2	84.0	94.2	101.0	103.5	

Formwork height 4.00 m



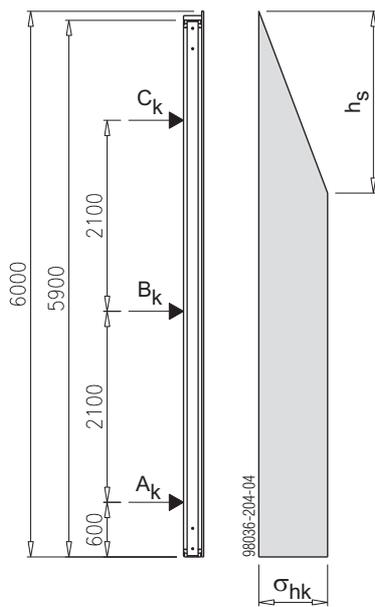
Permitted fresh-concrete pressure σ_{hk} [kN/m ²]	30	40	50	60	70	80	90	100
Beam centres [cm]	60	48	41	34	30	28	28	28
Cantilever deflection at top [mm]	3.1	-0.1	-1.9	-2.5	-2.5	-2.1	-1.8	-1.6
Max. span deflection [mm]	1.8	2.5	3.0	2.9	2.7	2.4	2.2	2.1
Cantilever deflection at bottom [mm]	-0.9	-1.5	-1.8	-1.8	-1.5	-1.2	-0.8	-0.7
Waling load B_k [kN/m]	57.0	66.1	71.7	74.4	75.1	74.7	73.8	73.3
Waling load A_k [kN/m]	45.0	61.9	78.3	93.6	106.9	117.3	124.2	126.7

Formwork height 5.00 m



Permitted fresh-concrete pressure σ_{hk} [kN/m ²]	30	40	50	60	70	80	90	100
Beam centres [cm]	71	53	43	36	31	28	27	25
Cantilever deflection at top [mm]	0.0	-0.7	-0.8	-0.6	-0.3	-0.1	-0.1	0.0
Max. span deflection [mm]	0.9	0.9	0.9	1.0	1.1	1.2	1.3	1.2
Cantilever deflection at bottom [mm]	-0.3	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.5
Waling load C_k [kN/m]	36.8	40.4	41.6	41.4	40.6	39.9	39.4	39.4
Waling load B_k [kN/m]	55.5	74.8	92.3	106.8	117.5	124.4	127.6	128.2
Waling load A_k [kN/m]	39.7	52.8	66.1	79.9	93.9	107.8	121.0	132.5

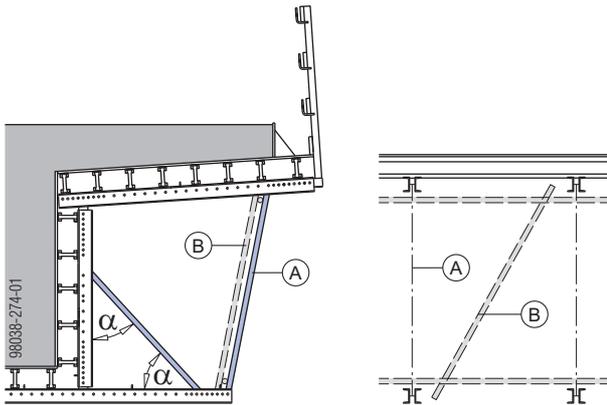
Formwork height 6.00 m



Permitted fresh-concrete pressure σ_{hk} [kN/m ²]	30	40	50	60	70	80	90	100
Beam centres [cm]	56	42	33	28	24	21	19	18
Cantilever deflection at top [mm]	-0.1	-1.5	1.9	-1.8	-1.5	-1.0	-0.7	-0.4
Max. span deflection [mm]	1.9	1.9	1.8	1.9	2.1	2.2	2.4	2.5
Cantilever deflection at bottom [mm]	-1.1	-1.0	-1.0	-1.1	-1.2	-1.3	-1.4	-1.5
Waling load C_k [kN/m]	46.6	52.8	56.0	57.0	56.7	55.8	54.7	53.8
Waling load B_k [kN/m]	69.8	94.5	118.2	139.7	158.1	172.9	183.8	190.8
Waling load A_k [kN/m]	45.7	60.7	75.8	91.3	107.2	123.3	139.5	155.4

Struts

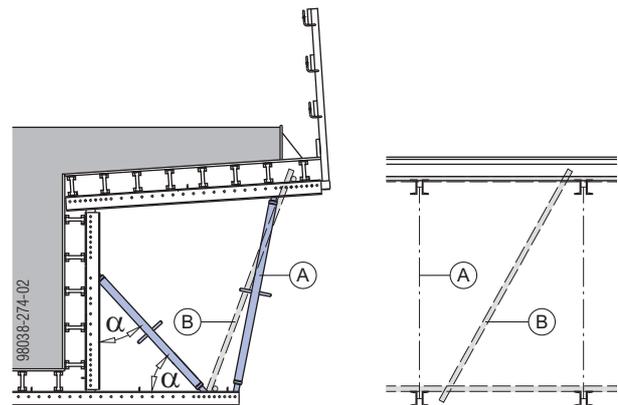
Fixed struts



Min. angle α between strut and waling = 30°

- A** Strut
- B** Bracing

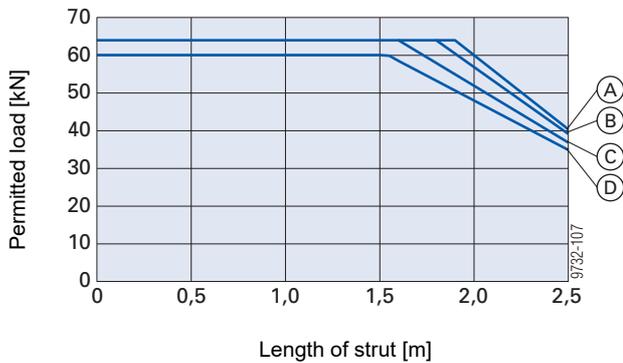
Spindle struts



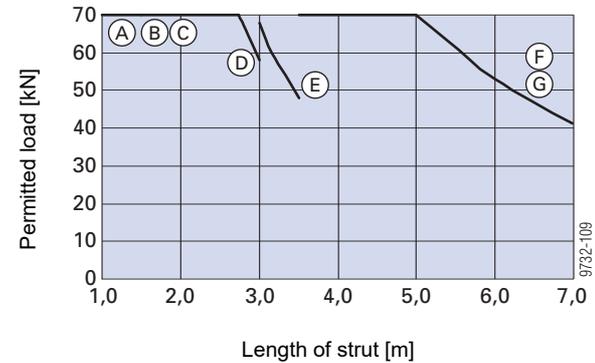
Min. angle α between strut and waling = 30°

- A** Spindle strut
- B** Bracing

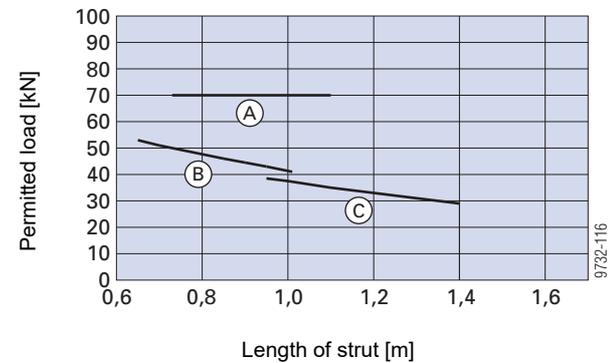
Universal strut T5/5mm



- A** With no bracing on the strut
Ensure that the parallel frame sections are adequately braced!
- B** With bracing on the strut
- C** With bracing on the strut + 2% longitudinal bridge slope
- D** With bracing on the strut + 4% longitudinal bridge slope



- A** Spindle strut T6 100/150cm
- B** Spindle strut T7 150/200cm
- C** Spindle strut T7 200/250cm
- D** Spindle strut T7 250/300cm
- E** Spindle strut T7 305/355cm
- F** Spindle strut T10 350/400cm
- G** Spindle strut T10mm (specify min. length of strut)



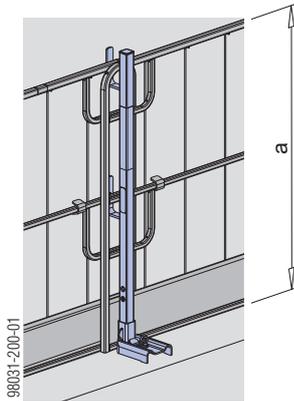
- A** Spindle strut T6 73/110cm
- B** Spindle strut GS T5 65/101cm
- C** Spindle strut GS T6 95/140cm
- D** Spindle strut GS T7 109/166cm

General

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



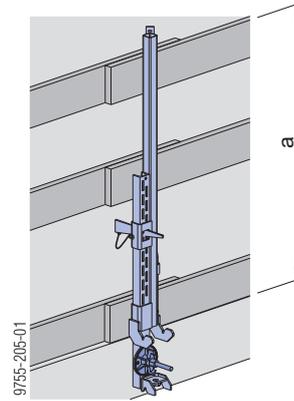
a ... > 1.00 m



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



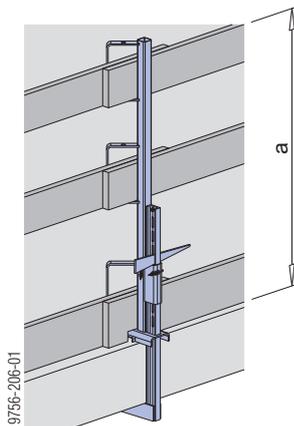
a ... > 1.00 m



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



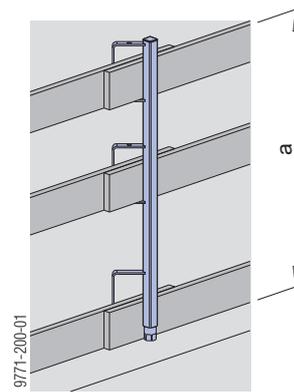
a ... > 1.00 m



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!

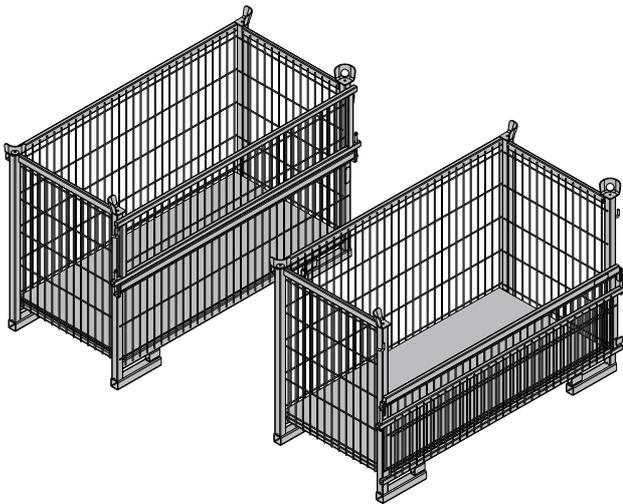
Doka multi-trip packaging

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.

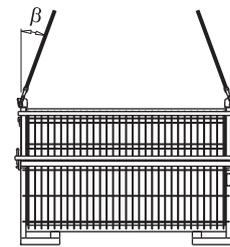
Using Doka skeleton transport boxes 1.70x0.80m as transport devices

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 β max. 30°!



9234-203-01

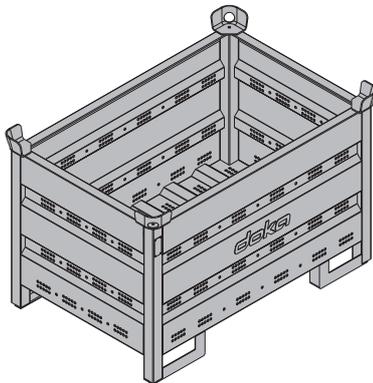
Repositioning by forklift truck or pallet stacking truck

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

Doka multi-trip transport box

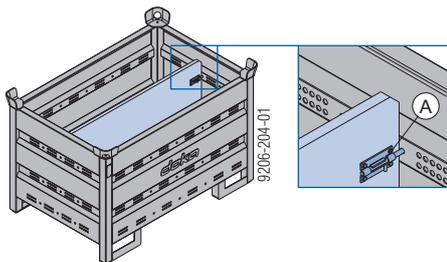
Storage and transport device for small items

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**.



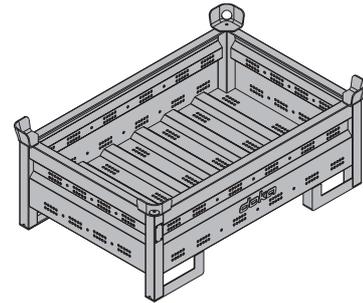
A Slide-bolt for fixing the partition

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

9206-204-02	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) Floor gradients up to 3%		Indoors 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.

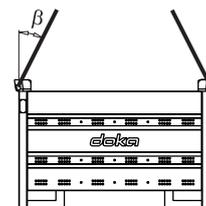
Using Doka multi-trip transport boxes as transport devices

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 β max. 30°!



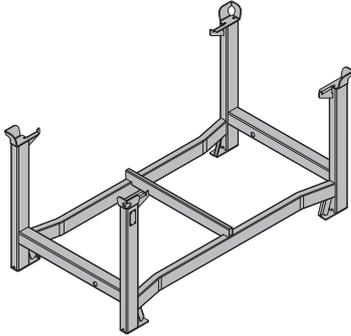
9206-202-01

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.

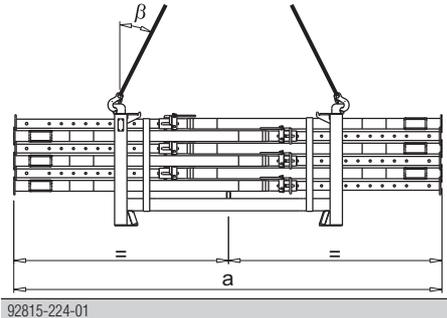
Using Doka stacking pallets as transport devices

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 β max. 30°!



92815-224-01

	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

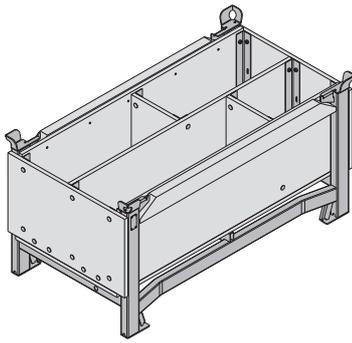


NOTICE

- 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.

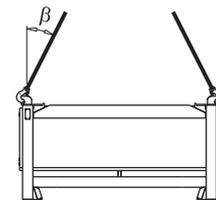
Doka accessory box as transport devices

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 β max. 30°!



92816-206-01

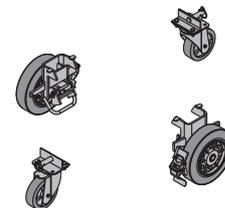
Repositioning by forklift truck or pallet stacking truck

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

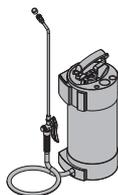


Follow the directions in the 'Bolt-on castor set B' Operating Instructions!

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 out 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)
- Load-bearing tower Staxo 40 (for formwork of over 6.70 m in height)

Cleaning equipment

High-pressure spray cleaner

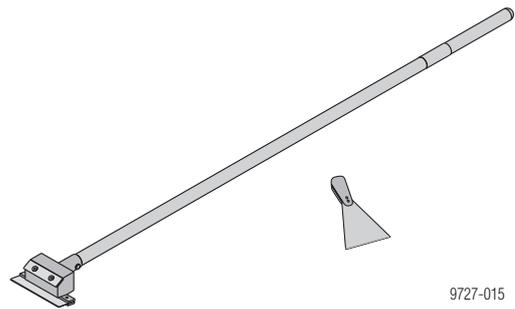


NOTICE

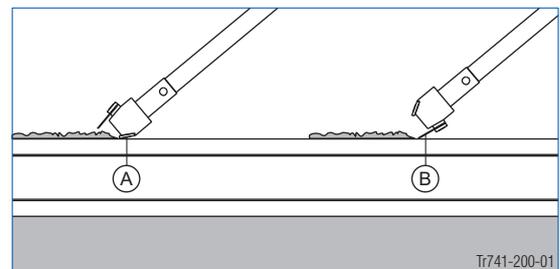
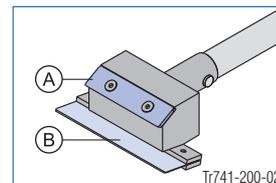
- Appliance pressure rating: 200 to max. 300 bar
- Keep the water-jet the correct distance from the formwork, and move it at the right speed:
 - The higher the pressure, the further away from the formwork you must keep the jet and the faster you must move it across the surface.
- Do not aim the jet at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

Concrete scraper

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



Functional description:



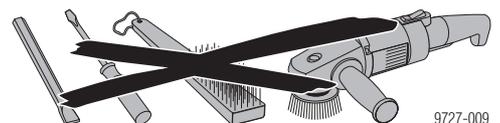
A Blade for dealing with heavy soiling

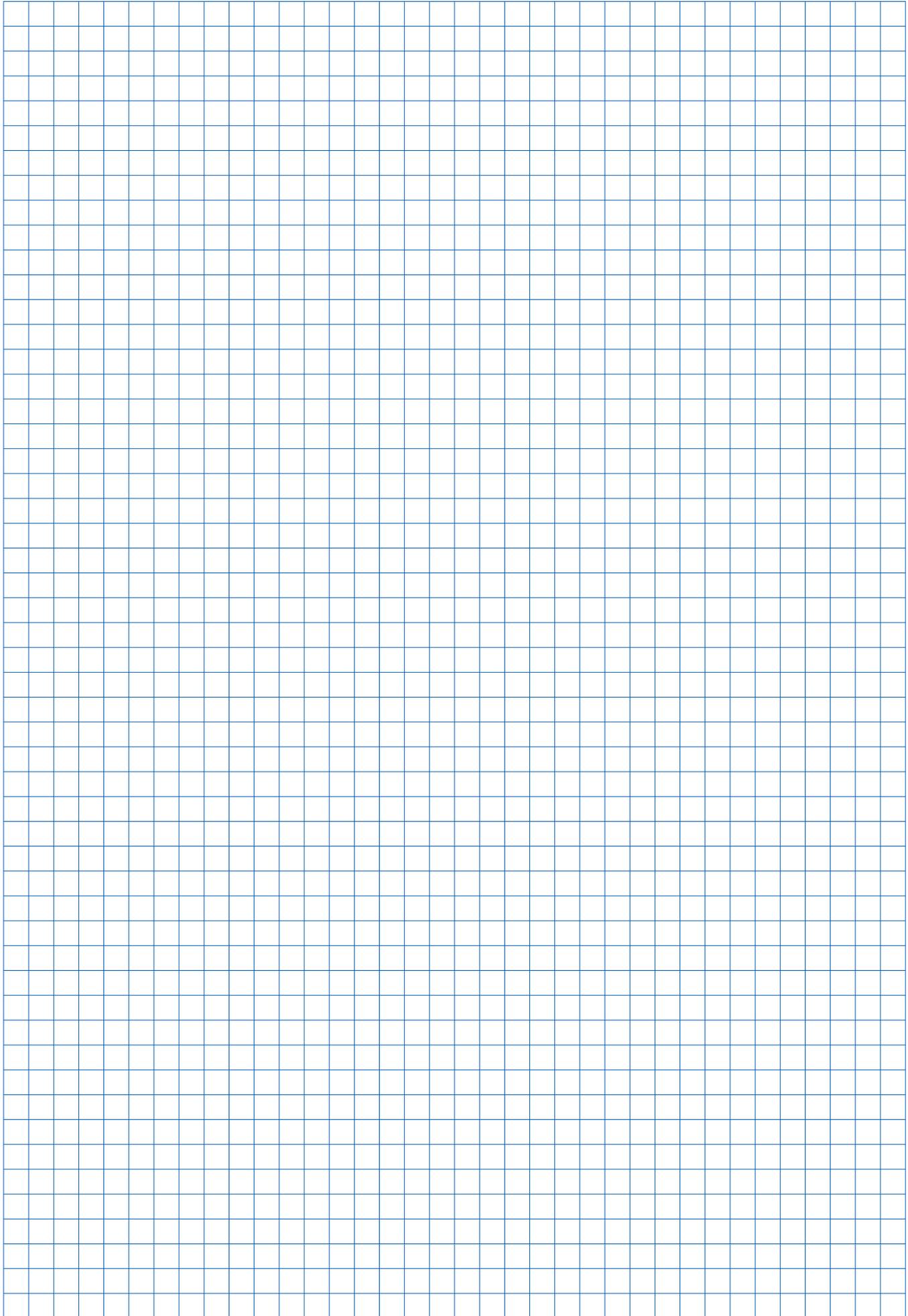
B Blade for dealing with slight soiling

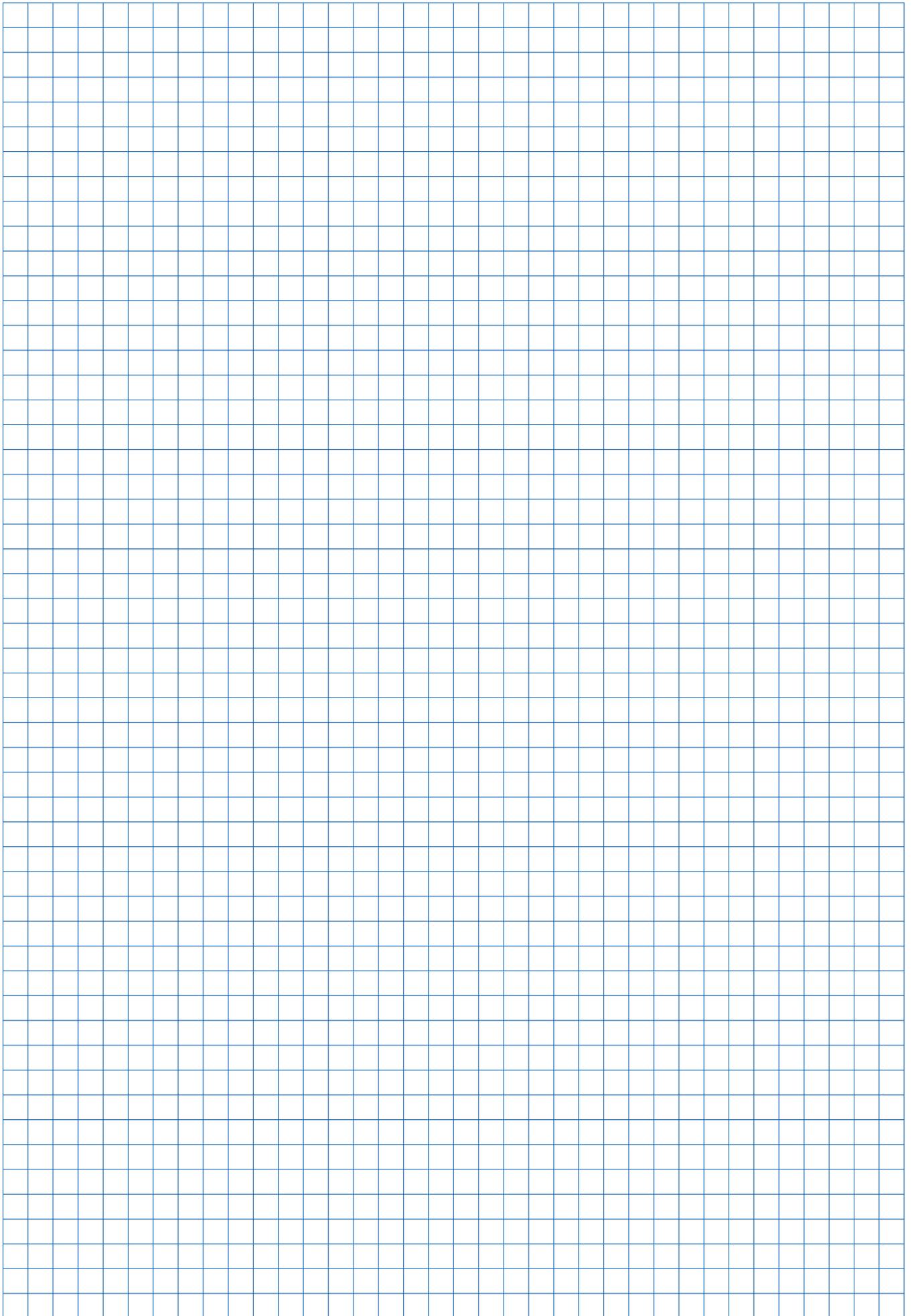


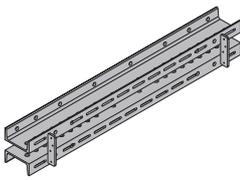
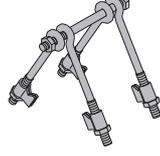
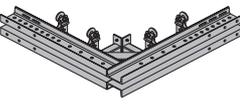
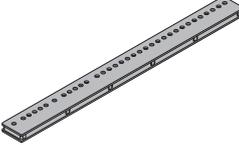
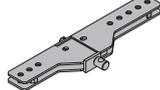
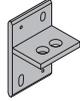
NOTICE

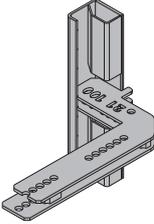
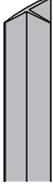
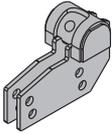
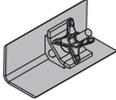
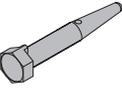
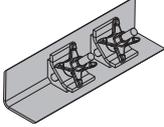
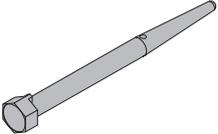
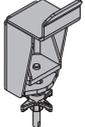
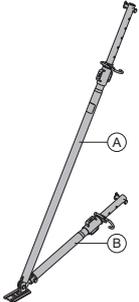
Do not use pointed or sharp objects, wire brushes, abrasive disks or cup brushes.

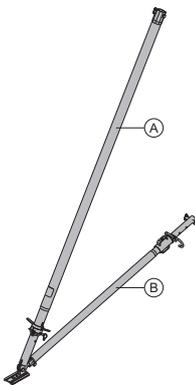
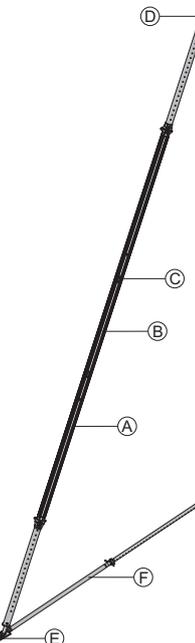
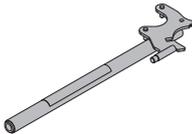
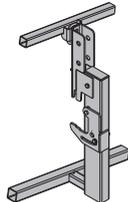
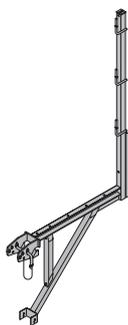


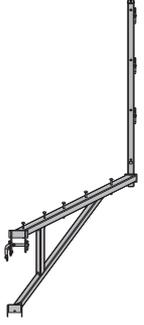
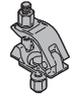
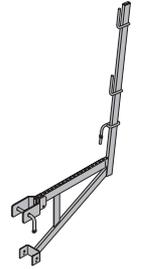
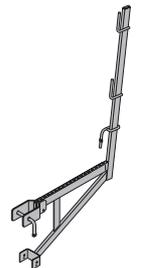
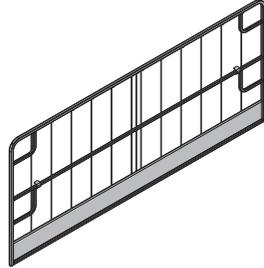


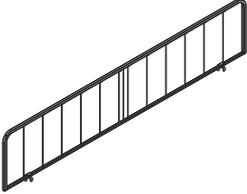
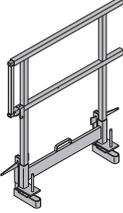
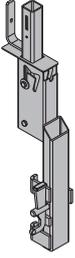


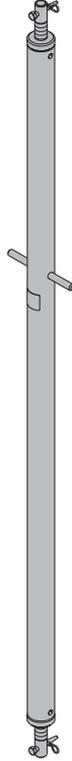
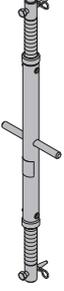
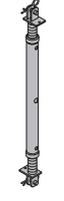
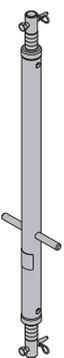
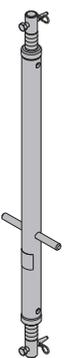
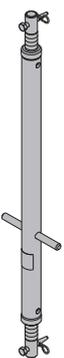
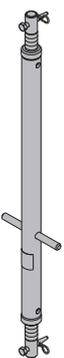
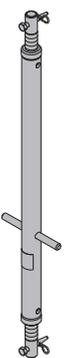
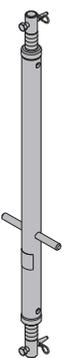
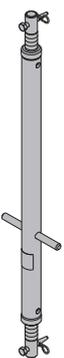
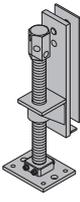
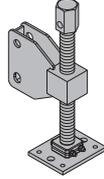
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Top100 tec waling WU14 0.50m	15.2	586901000	 <p>Painted blue</p>		
Top100 tec waling WU14 0.75m	21.4	586902000			
Top100 tec waling WU14 1.00m	28.6	586903000			
Top100 tec waling WU14 1.25m	38.3	586904000			
Top100 tec waling WU14 1.50m	43.3	586905000			
Top100 tec waling WU14 1.75m	51.2	586906000			
Top100 tec waling WU14 2.00m	57.8	586907000			
Top100 tec waling WU14 2.25m	67.8	586908000			
Top100 tec waling WU14 2.50m	72.2	586909000			
Top100 tec waling WU14 2.75m	79.0	586910000			
Top100 tec waling WU14 3.00m	85.8	586911000			
Top100 tec waling WU14 3.50m	100.7	586912000			
Top100 tec waling WU14 4.00m	114.2	586913000			
Top100 tec waling WU14 4.50m	136.5	586914000			
Top100 tec waling WU14 5.00m	144.5	586915000			
Top100 tec waling WU14 5.50m	166.5	586916000			
Top100 tec waling WU14 6.00m	182.2	586917000			
Top100 tec-Riegel WU14					
Beam screw S 8/70 Riegelverschraubung S 8/70			 <p>Galvanised Length: 8 cm Width-across: 13 mm</p>	0.06	580116500
Beam screw H 8/70 Riegelverschraubung H 8/70			 <p>Galvanised Length: 8 cm Width-across: 13 mm</p>	0.06	580117000
Fastening plate Anschraublase			 <p>Painted blue Width: 13 cm Height: 15 cm Width-across: 24 mm</p>	2.7	580110000
Flange claw Flanschkralle			 <p>Galvanised Width: 17 cm Width-across: 18 mm</p>	1.0	580137000
Lifting bracket Kranöse			 <p>Galvanised Height: 59 cm</p>	6.2	580460000
Top100 tec outside corner waling Top100 tec-Außeneckriegel	76.8	586919000	 <p>Painted blue Leg length: 110 cm</p>		
Top100 tec inside corner waling Top100 tec-Inneneckriegel	23.4	586918000	 <p>Painted blue Leg length: 45.9 cm</p>		
Top100 tec corner profile 1.15m	4.7	586921000	 <p>Galvanised, powder-coated</p>		
Top100 tec corner profile 2.90m	12.5	586920000			
Top100 tec corner profile 3.50m	14.5	586933000			
Top100 tec formwork element connector Top100 tec-Elementverbinder			 <p>Painted blue Length: 76 cm</p>	11.6	586923000
Top100 tec adjustable waling extension Top100 tec-Ausgleichslasche			 <p>Painted blue Length: 137 cm</p>	20.9	586924000
Waling clamp H20 Riegelklammer H20	0.22	580114000	 <p>Galvanised Width: 8 cm Width-across: 13 mm</p>		
Waling clamp 2G Riegelklammer 2G	0.45	580118000	 <p>Galvanised Width: 7.7 cm Height: 12 cm Width-across: 19 mm</p>		
Flange clamp G Flanschklammer G	1.1	580120000	 <p>Galvanised Width: 13 cm Width-across: 19 mm</p>		
Top100 tec ply joint adjuster Top100 tec-Einrichtlasche			 <p>Galvanised Length: 76 cm</p>	14.3	586935000
Beam clamp Top50 Trägerklammer Top50			 <p>Painted blue Height: 15 cm</p>	1.2	580081000

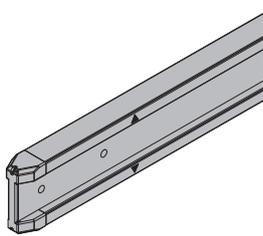
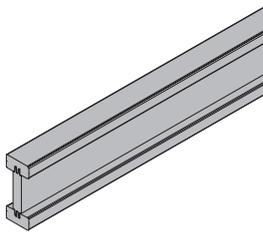
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Top100 tec anchoring plate Top100 tec-Ankerungslasche  Painted blue Length: 56 cm	7.1	586925000	Joint plate 3.00m Joint plate 4.00m Ausgleichsschiene Powder-coated blue 	36.8 47.7	580332000 580334000
Top100 tec internal angle plate Top100 tec-Innenecklasche  Painted blue Leg length: 70 cm	25.8	586926000			
Top100 tec transition plate 21mm Top100 tec-Übergangslasche 21mm  Painted blue Height: 51 cm	15.5	586927000	T ledge 21/42 2.00m T-Leiste 21/42 2,00m Grey 	0.34	580196000
Top100 tec angle tie bracket WU14 Top100 tec-Winkelspanner WU14  Painted blue Length: 26.9 cm	8.9	586928000	Box-out clamp type 1cm Aussparungsklemme Typ 1cm Painted blue Leg length: 10 cm 	17.4	580066000
Connecting pin 10cm Verbindungsbolzen 10cm  Galvanised Length: 14 cm	0.34	580201000	Box-out clamp type 2cm Aussparungsklemme Typ 2cm Painted blue Leg length: 10 cm 	17.4	580067000
Connecting pin 25cm Verbindungsbolzen 25cm  Galvanised Length: 25 cm	0.58	580202000	Wall-formwork support angle Auflegewinkel Wandschalung  Galvanised Length: 15.8 cm Width: 12 cm Height: 28 cm	6.6	588967000
Spring cotter 5mm Federvorstecker 5mm  Galvanised Length: 13 cm	0.03	580204000	Panel strut 340 IB Elementstütze 340 IB consisting of: (A) Plumbing strut 340 IB Galvanised Length: 190.8 - 341.8 cm (B) Adjusting strut 120 IB Galvanised Length: 81.5 - 130.6 cm Galvanised Delivery condition: folded closed 	24.3	580365000
Stacking plate H20 Aufstocklasche H20  Galvanised Length: 68.8 cm Width-across: 30 mm	8.3	580310000			

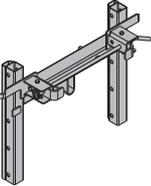
	[kg]	Article N°		[kg]	Article N°
Panel strut 540 IB Elementstütze 540 IB consisting of:	41.4	580366000			
(A) Plumbing strut 540 IB Galvanised Length: 310.5 - 549.2 cm	30.7	588697000			
(B) Adjusting strut 220 IB Galvanised Length: 172.5 - 221.1 cm	10.9	588251500			
 Galvanised Delivery condition: folded closed					
Eurex 60 550 Eurex 60 550 depending on length, comprising:					
(A) Plumbing strut Eurex 60 550 Powder-coated blue Aluminium Length: 343 - 553 cm	42.5	582658000			
(B) Extension Eurex 60 2.00m Powder-coated blue Aluminium Length: 250 cm	21.3	582651000			
(C) Coupler Eurex 60 Aluminium Length: 100 cm Diameter: 12.8 cm	8.6	582652000			
(D) Connector Eurex 60 IB Galvanised Length: 15 cm Width: 15 cm Height: 30 cm	4.2	582657500			
(E) Plumbing strut shoe Eurex 60 EB Galvanised Length: 31 cm Width: 12 cm Height: 33 cm	8.0	582660500			
(F) Adjusting strut 540 Eurex 60 IB Galvanised Length: 303.5 - 542.2 cm	27.8	582659500			
 Delivery condition: separate parts					
Prop head EB Stützenkopf EB	3.1	588244500		Galvanised Length: 40.8 cm Width: 11.8 cm Height: 17.6 cm	
Prop head Eurex 60 Top50 Stützenkopf Eurex 60 Top50	7.1	582665000		Galvanised Height: 50 cm	
Universal dismantling tool Universal-Lösewerkzeug	3.7	582768000		Galvanised Length: 75.5 cm	
Doka express anchor 16x125mm Doka-Expressanker 16x125mm	0.31	588631000		Galvanised Length: 18 cm Follow the directions in the "Fitting instructions"!	
Doka coil 16mm Doka-Coil 16mm	0.009	588633000		Galvanised Diameter: 1.6 cm	
Xsafe plus lifting adapter for beam formwork Xsafe plus-Umsetzadapter Trägerschalung	14.0	586439000		Galvanised Width: 66 cm Height: 89 cm	
Universal bracket 90 Universal-Konsole 90	30.4	580476000		Galvanised Length: 121 cm Height: 235 cm	

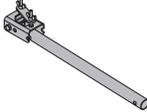
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Universal corner bracket 90 right Universal corner bracket 90 left Universal-Eckkonsole 90  Galvanised Length: 152 cm Height: 235 cm	29.5	580071000	Screw-on coupler 48mm 50 Anschraubkupplung 48mm 50  Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!	0.84	682002000
Top scaffold bracket L Betonierkonsole L  Galvanised Length: 152 cm Height: 159 cm	12.6	587153500	Swivel coupler 48mm Drehkupplung 48mm  Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!	1.5	582560000
Top scaffold bracket L painted Betonierkonsole L lackiert  Painted blue Length: 101 cm Height: 159 cm	12.0	587153000	Handrail post XP 1.20m Geländersteher XP 1,20m  Galvanised Height: 118 cm	4.1	586460000
Universal railing shackle Universal-Geländerbügel  Galvanised Height: 20 cm	3.0	580478000	Toeboard holder XP 1.20m Fußwehrhalter XP 1,20m  Galvanised Height: 21 cm	0.64	586461000
Scaffold tube connection Gerüstrohranschluss  Galvanised Height: 7 cm	0.27	584375000	Handrail post XP 0.60m Geländersteher XP 0,60m  Galvanised Height: 68 cm	5.0	586462000
Scaffold tube 48.3mm 0.50m Scaffold tube 48.3mm 1.00m Scaffold tube 48.3mm 1.50m Scaffold tube 48.3mm 2.00m Scaffold tube 48.3mm 2.50m Scaffold tube 48.3mm 3.00m Scaffold tube 48.3mm 3.50m Scaffold tube 48.3mm 4.00m Scaffold tube 48.3mm 4.50m Scaffold tube 48.3mm 5.00m Scaffold tube 48.3mm 5.50m Scaffold tube 48.3mm 6.00m Scaffold tube 48.3mmm Gerüstrohr 48,3mm  Galvanised	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	Toeboard holder XP 0.60m Fußwehrhalter XP 0,60m  Galvanised Height: 21 cm	0.77	586463000
			Protective grating XP 2.70x1.20m Protective grating XP 2.50x1.20m Protective grating XP 2.00x1.20m Protective grating XP 1.20x1.20m Schutzgitter XP  Galvanised	22.2 20.5 17.4 12.0	586450000 586451000 586452000 586453000

	[kg]	Article N°		[kg]	Article N°
Protective grating XP 2.70x0.60m Protective grating XP 2.50x0.60m Protective grating XP 2.00x0.60m Protective grating XP 1.20x0.60m Schutzgitter XP Galvanised 	10.1 9.5 8.0 5.0	586466000 586472000 586473000 586491000			
Handrail post 1.10m Schutzgeländer 1,10m Galvanised Height: 134 cm 				5.5	584384000
Velcro fastener 30x380mm Klettverschluss 30x380mm Yellow 	0.02	586470000			
Side handrail clamping unit T Seitenschutzgeländer T Galvanised Length: 115 - 175 cm Height: 112 cm 				29.1	580488000
Railing clamp XP 40cm Geländerzwinge XP 40cm Galvanised Height: 73 cm 	7.7	586456000			
Handrail post T 1.80m Einschubgeländer T 1,80m Galvanised 				17.7	584373000
Timber-beam formwork adapter XP Trägerschalungsadapter XP Galvanised Height: 83.5 cm 	9.5	586476000			
Toeboard holder T 1.80m Fußwehrhalter T 1,80m Galvanised Height: 13.5 cm 				0.53	584392000
Handrail clamp S Schutzgeländerzwinge S Galvanised Height: 123 - 171 cm 	11.5	580470000			
Doka 4-part chain 3.20m Doka-Vierstrangkette 3,20m Follow the directions in the "Operating Instructions!" 				15.0	588620000
Handrail clamp T Schutzgeländerzwinge T Galvanised Height: 122 - 155 cm 	12.3	584381000			
Universal strut T5/5mm Strebe T5/5mm Painted blue Weight per linear metre 				6.5	584311000

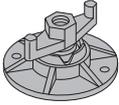
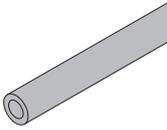
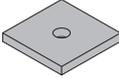
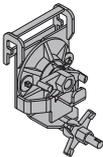
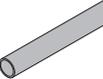
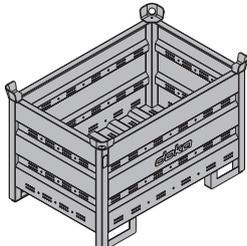
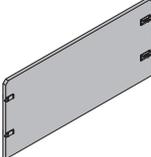
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Spindle strut GS T5 65/101cm Spindelstrebe GS T5 65/101cm Galvanised 	9.1	584356000			
Spindle strut T10 350/400cm Spindelstrebe T10mm Galvanised 	57.5	584328000		16.9	584391000
Spindle strut T6 73/110cm Spindelstrebe T6 Galvanised 	10.2	584355000			
Spindle strut T6 100/150cm Spindelstrebe T6 Galvanised 	12.5	584323000			
Spindle strut GS T6 95/140cm Spindelstrebe GS T6 95/140cm Galvanised 	10.3	584340000			
Spindle strut T7 75/110cm Spindelstrebe T7 Galvanised 	13.2	584308000			
Spindle strut T7 100/150cm Spindelstrebe T7 Galvanised 	16.8	584309000			
Spindle strut T7 150/200cm Spindelstrebe T7 Galvanised 	21.6	584324000			
Spindle strut T7 200/250cm Spindelstrebe T7 Galvanised 	26.2	584325000			
Spindle strut T7 250/300cm Spindelstrebe T7 Galvanised 	29.4	584326000			
Spindle strut T7 305/355cm Spindelstrebe T7 Galvanised 	35.0	584327000			
Height adjuster for formwork beams Höhenjustierung für Schalungsträger Galvanised Height: 46 cm 	11.9	580218000			
Height adjuster WS10-WU16 Höhenjustierung WS10-WU16 Galvanised Height: 45 cm 	10.1	580206500			
Adjusting spindle M36 Höhenjustierspindel M36 Galvanised Length: 31 cm Height: 29.2 cm Width-across: 24 mm 	6.2	500663002			
Adjusting plate T Justierlasche T Painted blue Length: 23.5 cm 	6.5	584393000			

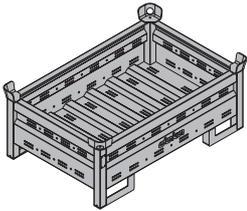
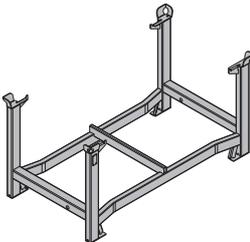
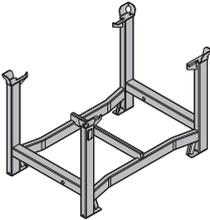
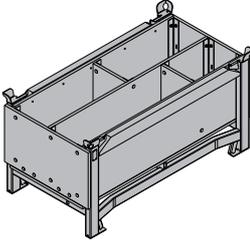
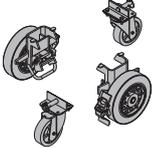
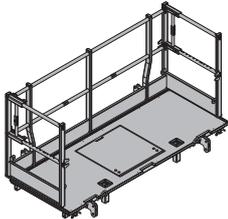
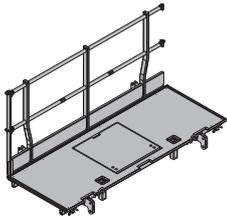
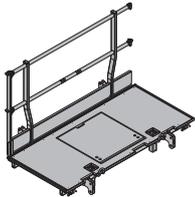
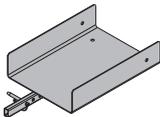
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Doka beam I tec 20 1.80m	10.1	188001000			
Doka beam I tec 20 2.45m	13.7	188002000			
Doka beam I tec 20 2.65m	14.8	188003000			
Doka beam I tec 20 2.90m	16.2	188004000			
Doka beam I tec 20 3.30m	18.5	188005000			
Doka beam I tec 20 3.60m	20.2	188006000			
Doka beam I tec 20 3.90m	21.8	188007000			
Doka beam I tec 20 4.50m	25.2	188008000			
Doka beam I tec 20 4.90m	27.4	188009000			
Doka beam I tec 20 5.35m	30.0	188013000			
Doka beam I tec 20 5.90m	33.0	188010000			
Doka beam I tec 20m	5.6	188011000			
Doka-Träger I tec 20					
 Varnished yellow Grey					
Doka beam I tec 20 12.00m	67.2	188012000			
Doka-Träger I tec 20 12,00m					
 Varnished yellow Grey					
I tec 20 beam-end sealant 2.5l	2.5	188014000			
I tec 20-Endenversiegelung 2,5l					
 Yellow					
Doka formwork sheet 3-SO 21mm 100/50cm	4.9	186007000	Doka formwork sheet 3-SO 27mm 100/50cm	6.1	187007000
Doka formwork sheet 3-SO 21mm 150/50cm	7.3	186008000	Doka formwork sheet 3-SO 27mm 150/50cm	9.1	187008000
Doka formwork sheet 3-SO 21mm 200/50cm	9.7	186009000	Doka formwork sheet 3-SO 27mm 200/50cm	12.1	187009000
Doka formwork sheet 3-SO 21mm 250/50cm	12.1	186011000	Doka formwork sheet 3-SO 27mm 250/50cm	15.1	187011000
Doka formwork sheet 3-SO 21mm 300/50cm	14.6	186012000	Doka formwork sheet 3-SO 27mm 300/50cm	18.2	187012000
Doka formwork sheet 3-SO 21mm 350/50cm	17.0	186028000	Doka formwork sheet 3-SO 27mm 350/50cm	21.2	187028000
Doka formwork sheet 3-SO 21mm 400/50cm	19.4	186013000	Doka formwork sheet 3-SO 27mm 400/50cm	24.2	187013000
Doka formwork sheet 3-SO 21mm 450/50cm	21.8	186029000	Doka formwork sheet 3-SO 27mm 450/50cm	27.2	187029000
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Doka formwork sheet 3-SO 21mm 150/100cm	14.6	186016000	Doka formwork sheet 3-SO 27mm 150/100cm	18.2	187016000
Doka formwork sheet 3-SO 21mm 200/100cm	19.4	186017000	Doka formwork sheet 3-SO 27mm 200/100cm	24.2	187017000
Doka formwork sheet 3-SO 21mm 250/100cm	24.3	186018000	Doka formwork sheet 3-SO 27mm 250/100cm	30.3	187018000
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Doka formwork sheet 3-SO 21mm 350/100cm	34.0	186030000	Doka formwork sheet 3-SO 27mm 350/100cm	42.4	187030000
Doka formwork sheet 3-SO 21mm 400/100cm	38.8	186020000	Doka formwork sheet 3-SO 27mm 400/100cm	48.4	187020000
Doka formwork sheet 3-SO 21mm 450/100cm	43.7	186031000	Doka formwork sheet 3-SO 27mm 450/100cm	54.5	187031000
Doka formwork sheet 3-SO 21mm 500/100cm	48.5	186021000	Doka formwork sheet 3-SO 27mm 500/100cm	60.5	187021000
Doka formwork sheet 3-SO 21mm 550/100cm	53.4	186022000	Doka formwork sheet 3-SO 27mm 550/100cm	66.6	187022000
Doka formwork sheet 3-SO 21mm 600/100cm	58.2	186024000	Doka formwork sheet 3-SO 27mm 600/100cm	72.6	187024000
Doka formwork sheet 3-SO 21mm 250/125cm	30.3	186097000	Doka formwork sheet 3-SO 27mm 250/125cm	37.8	187106000
Doka formwork sheet 3-SO 21mm 300/150cm	43.7	186098000	Doka formwork sheet 3-SO 27mm 300/150cm	54.5	187107000
Doka formwork sheet 3-SO 21mm 600/150cm	87.3	186099000	Doka formwork sheet 3-SO 27mm 600/150cm	108.9	187108000
Doka formwork sheet 3-SO 21mm 150/50cm BS	7.3	186008100	Doka formwork sheet 3-SO 27mm 150/50cm BS	9.1	187008100
Doka formwork sheet 3-SO 21mm 200/50cm BS	9.7	186009100	Doka formwork sheet 3-SO 27mm 200/50cm BS	12.1	187009100
Doka formwork sheet 3-SO 21mm 250/50cm BS	12.1	186011100	Doka formwork sheet 3-SO 27mm 250/50cm BS	15.1	187011100
Doka formwork sheet 3-SO 21mm 300/50cm BS	14.6	186012100	Doka formwork sheet 3-SO 27mm 300/50cm BS	18.2	187012100
Doka formwork sheet 3-SO 21mm			Doka-Schalungsplatte 3-SO 27mm		
			Dokaplex formwork sheet 9mm 250/150cm	24.4	185001000
			Dokaplex formwork sheet 9mm 300/150cm	29.3	185006000
			Dokaplex-Schalungsplatte 9mm		
			Dokaplex formwork sheet 18mm 250/150cm	47.3	185011000
			Dokaplex formwork sheet 18mm 300/150cm	56.7	185012000
			Dokaplex-Schalungsplatte 18mm		
			Dokaplex formwork sheet 21mm 250/125cm	45.9	185007000
			Dokaplex formwork sheet 21mm 250/150cm	55.1	185002000
			Dokaplex formwork sheet 21mm 300/150cm	66.2	185003000
			Dokaplex-Schalungsplatte 21mm		
			DokaPly Birch DC 18mm 62.5/250cm	20.2	185052000
			DokaPly Birch DC 18mm 122/244cm	36.3	185085000
			DokaPly Birch DC 18mm 125/250cm	38.5	185055000
			DokaPly Birch DC 18mm 150/300cm	58.1	185068000
			DokaPly Birch DC 18mm/.....cm	12.2	185086000
			DokaPly Birch DC 18mm		
			DokaPly Birch SC 18mm 122/244cm	36.3	185078000
			DokaPly Birch SC 18mm 125/250cm	38.3	185131000
			DokaPly Birch SC 18mm 150/300cm	54.9	185079000
			DokaPly Birch SC 18mm/.....cm	12.2	185080000
			DokaPly Birch SC 18mm		
			DokaPly Birch DC 21mm 62.5/250cm	23.0	185051000
			DokaPly Birch DC 21mm 122/244cm	42.6	185087000
			DokaPly Birch DC 21mm 125/250cm	45.9	185024000
			DokaPly Birch DC 21mm 150/300cm	66.2	185075000
			DokaPly Birch DC 21mm/.....cm	14.3	185088000
			DokaPly Birch DC 21mm		
			DokaPly Birch SC 21mm 122/244cm	42.6	185081000
			DokaPly Birch SC 21mm 125/250cm	44.7	185082000
			DokaPly Birch SC 21mm 150/300cm	64.4	185083000
			DokaPly Birch SC 21mm/.....cm	14.3	185084000
			DokaPly Birch SC 21mm		
			Xface sheet 21mm 202/302cm	91.5	185050000
			Xface sheet 21mm 202/402cm	121.8	185076000
			Xface sheet 21mm 202/502cm	152.1	185077000
			Xface-Platte 21mm		
			Xlife sheet 21mm 265/145cm	63.4	185071000
			Xlife sheet 21mm 325/145cm	77.8	185070000
			Xlife-Platte 21mm		

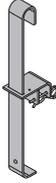
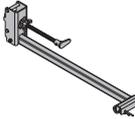
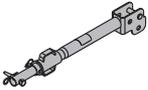
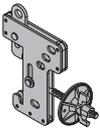
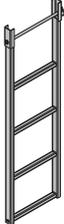
	[kg]	Article N°
Xlife edge varnish 2.5l Xlife-Kantenlack 2,5l 	3.2	185072000
Xlife priming varnish SW-910 2.5l Xlife-Grundierlack SW-910 2,5l 	2.7	185073000
H20 screw-on bracket for formwork sheets Schalhaut-Schraubwinkel H20  Galvanised Height: 19.2 cm	0.19	586256000
Double scraper Xlife 100/150mm 1.40m Doppelschaber Xlife 100/150mm 1,40m 	2.8	588674000
Ladder system XS		
Connector XS Wall formwork Anschluss XS Wandschalung  Galvanised Width: 89 cm Height: 63 cm	20.8	588662000
System ladder XS 4.40m System-Leiter XS 4,40m  Galvanised	33.2	588640000

	[kg]	Article N°
Ladder extension XS 2.30m Leiternverlängerung XS 2,30m  Galvanised	19.1	588641000
Securing barrier XS Sicherungsschranke XS  Galvanised Length: 80 cm	4.9	588669000
Ladder cage XS 1.00m Ladder cage XS 0.25m Rückenschutz XS  Galvanised	16.5 10.5	588643000 588670000
Ladder cage exit XS Rückenschutz-Ausstieg XS  Galvanised Height: 132 cm	17.0	588666000
Tie rod system 20.0		
Tie rod 20.0mm galvanised 0.50m Tie rod 20.0mm galvanised 0.75m Tie rod 20.0mm galvanised 1.00m Tie rod 20.0mm galvanised 1.25m Tie rod 20.0mm galvanised 1.50m Tie rod 20.0mm galvanised 2.00m Tie rod 20.0mm galvanised 2.50m Tie rod 20.0mm galvanisedm Tie rod 20.0mm non-treated 0.50m Tie rod 20.0mm non-treated 0.75m Tie rod 20.0mm non-treated 1.00m Tie rod 20.0mm non-treated 1.50m Tie rod 20.0mm non-treated 2.00m Tie rod 20.0mm non-treatedm Ankerstab 20,0mm 	1.3 1.9 2.5 3.2 3.8 5.0 6.3 2.5 1.3 1.9 2.5 3.8 5.0 2.5	581411000 581417000 581412000 581418000 581413000 581414000 581430000 581410000 581405000 581416000 581406000 581407000 581408000 581403000



		[kg]	Article N°		[kg]	Article N°			
Super plate 20.0 B Superplatte 20,0 B		Galvanised Height: 7 cm Diameter: 14 cm Width-across: 34 mm	2.0	581424000 	Rock anchor spreader unit 20.0 Felsanker-Spreizeinheit 20,0		Galvanised Length: 11.9 cm Diameter: 5.7 cm Follow the directions in the "Fitting instructions"!	1.3	581468000
Hexagon nut 20.0 Sechskantmutter 20,0		Galvanised Length: 7 cm Width-across: 41 mm	0.40	581420000 	Fibre concrete tube 27mm 1.25m Faserbetonrohr 27mm 1,25m			2.6	581472000
Anchor plate 20.0 Ankerplatte 20,0		Galvanised	1.7	581425000 	Fibre concrete plug 27mm Faserbetonstopfen 27mm		Grey	0.03	581473000
Top100 tec form-tie nut 20.0 Top100 tec-Ankermutter 20,0		Galvanised Height: 25 cm	4.8	586934000	Weldable coupler 20.0 Anschweißmuffe 20,0		Non-treated Length: 8 cm Diameter: 4 cm Follow the directions in the "Fitting instructions"!	0.55	581474000
Plastic tube 26mm 2.00m Kunststoffrohr 26mm 2,00m		PVC Grey Diameter: 3.1 cm	0.59	581463000	Protective cap 15.0/20.0 Schutzkappe 15,0/20,0		Yellow Length: 6 cm Diameter: 6.7 cm	0.03	581858000
Universal cone 26mm Universal-Konus 26mm		Grey Diameter: 5 cm	0.008	581464000	Multi-trip packaging				
Plug 26mm Verschlussstopfen 26mm		PE Grey	0.006	581465000	Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m		Galvanised Height: 113 cm	87.0	583012000
Tie hole protector 20.0 Ankerlochschutz 20,0		Galvanised Length: 7.5 cm Width: 4.3 cm	0.11	586931000	Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m		Galvanised Height: 78 cm	70.0	583011000
Wing nut 20.0 Flügelmutter 20,0		Galvanised Length: 11 cm Height: 6 cm Width-across: 36 mm	0.47	581466000 	Multi-trip transport box partition 0.80m Multi-trip transport box partition 1.20m Mehrwegcontainer Unterteilung		Steel parts galvanised Timber parts varnished yellow	3.7 5.5	583018000 583017000
Water stop connector 20.0 Wasserstopp 20,0		Non-treated Length: 14 cm	1.3	581467000					

	[kg]	Article N°		[kg]	Article N°
<p>Doka multi-trip transport box 1.20x0.80x0.41m Doka-Mehrwegcontainer 1,20x0,80x0,41m Galvanised</p> 	42.5	583009000			
<p>Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m Galvanised Height: 77 cm</p> 	41.0	586151000			
<p>Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m Galvanised Height: 77 cm</p> 	38.0	583016000			
<p>Doka accessory box Doka-Kleinteilebox Timber parts varnished yellow Steel parts galvanised Length: 154 cm Width: 83 cm Height: 77 cm</p> 	106.4	583010000			
<p>Bolt-on castor set B Anklemm-Radsatz B Painted blue</p> 	33.6	586168000			
<p>Platform system Xsafe plus</p>					
<p>Xsafe plus platform 2.50m with side railing Xsafe plus-Bühne 2,50m mit Seitengeländer Steel parts galvanised Timber parts varnished yellow Height: 136 cm Delivery condition: folded closed</p> 	182.2	586402000			
<p>Xsafe plus platform 2.50m Xsafe plus-Bühne 2,50m Steel parts galvanised Timber parts varnished yellow Height: 136 cm Delivery condition: folded closed</p> 	144.5	586405000			
<p>Xsafe plus platform 2.00m Xsafe plus-Bühne 2,00m Steel parts galvanised Timber parts varnished yellow Height: 136 cm Delivery condition: folded closed</p> 	122.5	586407000			
<p>Xsafe plus platform 1.00m Xsafe plus-Bühne 1,00m Steel parts galvanised Timber parts varnished yellow Height: 136 cm Delivery condition: folded closed</p> 	78.5	586409000			
<p>Xsafe plus side railing Xsafe plus-Seitengeländer Galvanised Width: 88 cm Height: 110 cm</p> 	20.5	586410000			
<p>Xsafe plus railing-closure post Xsafe plus-Geländerausgleich Galvanised Height: 111 cm</p> 	3.4	586411000			
<p>Xsafe plus platform extension 0.60m Xsafe plus-Bühnenverlängerung 0,60m Galvanised Height: 120 cm Delivery condition: railing included</p> 	43.4	586418000			
<p>Xsafe plus platform transition Xsafe plus-Bühnenübergang Galvanised Length: 85 cm Width: 48 cm</p> 	26.5	586419000			

	[kg]	Article N°		[kg]	Article N°
Xsafe plus handrail extension Xsafe plus-Geländerverlängerung  Galvanised Length: 81 cm Width: 53 cm	4.3	586420000	Xsafe plus ladder support Xsafe plus-Leiternstütze  Galvanised Height: 55 cm	2.1	586423000
Xsafe plus counter railing 2.50m Xsafe plus counter railing 2.00m Xsafe plus counter railing 1.00m Xsafe plus-Gegengeländer  Galvanised Height: 200 cm Delivery condition: folded closed	22.5 20.3 15.5	586426000 586428000 586430000	Xsafe plus ladder starter piece Xsafe plus-Leiternhalter  Galvanised Length: 95 cm	6.8	586424000
Xsafe plus supporting strut EB Xsafe plus-Stützenstrebe EB  Galvanised Length: 91 - 99 cm	8.0	586412500			
Xsafe plus waling connector Xsafe plus-Riegelverbinder  Galvanised Height: 33 cm	6.1	586433000			
Xsafe plus telescopic ladder Xsafe plus-Teleskopleiter  Galvanised Height: 158 - 274 cm	15.0	586421000			
Xsafe plus ladder extension 1.15m Xsafe plus-Leiternverlängerung 1,15m  Galvanised Height: 126 cm	7.0	586422000			

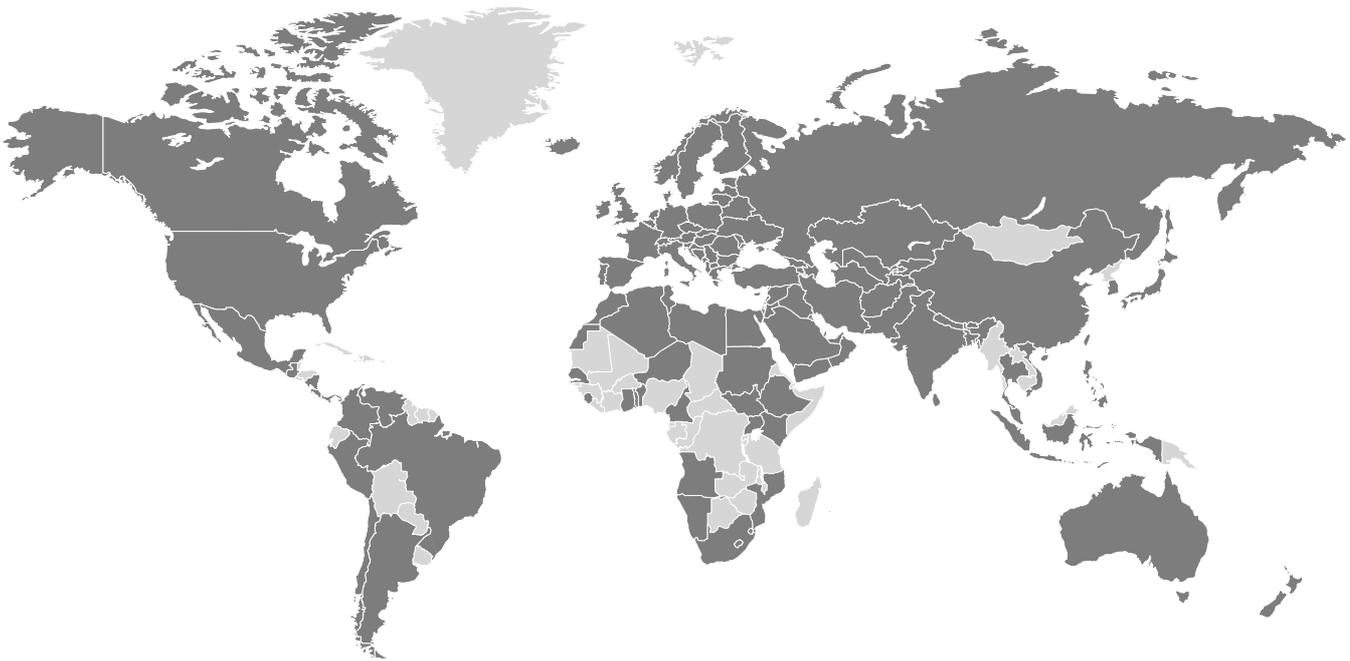
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