The Formwork Experts.

Dokaflex 30 tec

User Information
Instructions for assembly and use (Method statement)
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Elementary safety warnings

User target groups

- This manual 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 manual 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 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 rules throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

Hazard assessment

- The customer is responsible for drawing up, documenting, implementing and continually updating a hazard assessment at every job-site.

  This document 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 document

- This manual can also be used as a generic method statement or incorporated with a site-specific method statement.

- Many of the illustrations in this booklet show the situation during formwork assembly and are therefore not always complete from the safety point of view.

  Any safety accessories not shown in these illustrations must still be used by the customer, in accordance with the applicable rules and regulations.

- Further safety instructions, especially warnings, will be found in the individual sections of this document!

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 sideguard component and/or any of its accessories, the component affected may only continue in use after it has been inspected and passed by an expert.
Rules applying during all phases of the assignment

▪ The customer 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 of all components and units must be ensured during all phases of the construction work!
▪ The functional/technical instructions, safety warnings and loading data must all be strictly observed and complied with. Failure to do so can cause accidents and severe (even life-threatening) damage to health, as well as very great material damage.
▪ Fire-sources are not permitted anywhere near the formwork. Heating appliances are only allowed if properly and expertly used, and set up a safe distance away from the formwork.
▪ The work must take account of the weather conditions (e.g. risk of slippage). In extreme weather, steps must be taken in good time to safeguard the equipment, and the immediate vicinity of the equipment, and to protect employees.
▪ All connections must be checked regularly to ensure that they still fit properly and are functioning correctly.
   It is very important to check all screw-type connections and wedge-clamped joins whenever the construction operations require (particularly after exceptional events such as storms), and to tighten them if necessary.
▪ 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.
   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 suitable condition. Steps must be taken to rule out the use of any components that are damaged, deformed, or weakened due to wear, corrosion or rot.
▪ Combining our formwork systems with those of other manufacturers could be dangerous, risking damage to both health and property. If you intend to combine different systems, please contact Doka for advice first.
▪ The equipment/system must be assembled and erected in accordance with the applicable laws, Standards and rules by suitably skilled personnel of the customer’s, having regard to any and all required safety inspections.
▪ It is not permitted to modify Doka products; any such modifications constitute a safety risk.

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 out 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 regulations applying to the handling of formwork and scaffolding. In addition, the Doka slinging means must be used - this is a mandatory requirement.
- Remove any loose parts or fix them in place so that they cannot be dislodged or fall free!
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this manual!

Maintenance

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

Miscellaneous

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

Symbols used

The following symbols are used in this booklet:

**Important note**
Failure to observe this may lead to malfunction or damage.

**CAUTION / WARNING / DANGER**
Failure to observe this may lead to material damage, and to injury to health which may range up to the severe or even life-threatening.

**Instruction**
This symbol indicates that actions need to be taken 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**
Refers to other documents and materials.
Eurocodes at Doka

In Europe, a uniform series of Standards known as Eurocodes (EC) was developed for the construction field by the end of 2007. These are intended to provide a uniform basis, valid throughout Europe, for product specifications, tenders and mathematical verification.

The EC are the world's most highly developed Standards in the construction field.

In the Doka Group, the EC are to be used as standard from the end of 2008. They will thus supersede the DIN norms as the "Doka standard" for product design.

The widely used "Permissible stress design" (comparing the actual stresses with the permissible stresses) has been superseded by a new safety concept in the EC.

The EC contrast the actions (loads) with the resistance (capacity). The previous safety factor in the permissible stresses is now divided into several partial factors. The safety level remains the same!

\[ E_d \leq R_d \]

\( E_d \) Design value of effect of actions
\( F_d \) Design value of an action
\( F_k \) Characteristic value of an action
\( \gamma_F \) Partial factor for actions
\( R_d \) Design value of the resistance
\( R_k \) Characteristic value of the resistance
\( \gamma_M \) Partial factor for a material property
\( k_{\text{mod}} \) Modification factor

Comparison of the safety concepts (example)

<table>
<thead>
<tr>
<th>Permissible stress design</th>
<th>EC/DIN concept</th>
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</thead>
<tbody>
<tr>
<td>115.5 [kN] ( F_{\text{yield}} )</td>
<td>115.5 [kN] ( R_k )</td>
</tr>
<tr>
<td>90&lt;105 [kN] ( F_{\text{permissible}} )</td>
<td>( R_d )</td>
</tr>
<tr>
<td>60&lt;70 [kN] ( F_{\text{actual}} )</td>
<td>( E_d \leq R_d )</td>
</tr>
<tr>
<td>60 [kN]</td>
<td>( \gamma_F = 1.5 )</td>
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</tbody>
</table>

A Utilisation factor

The "permissible values" communicated in Doka documents (e.g.: \( Q_{\text{permissible}} = 70 \, \text{kN} \)) do not correspond to the design values (e.g.: \( V_{Rd} = 105 \, \text{kN} \))!

➤ Avoid any confusion between the two!
➤ Our documents will continue to state the permissible values.

Allowance has been made for the following partial factors:

- \( \gamma_F = 1.5 \)
- \( \gamma_M, \text{timber} = 1.3 \)
- \( \gamma_M, \text{steel} = 1.1 \)
- \( k_{\text{mod}} = 0.9 \)

In this way, all the design values needed in an EC design calculation can be ascertained from the permissible values.
Doka services

Support in every stage of the project

Doka offers a broad spectrum of services, all with a single aim: to help you succeed on the site. Every project is unique. Nevertheless, there is one thing that all construction projects have in common – and that is a basic structure with five stages. We at Doka know our clients’ varying requirements. With our consulting, planning and other services, we help you achieve effective implementation of your formwork assignment using our formwork products – in every one of these stages.

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1. **Project Development Stage**

   - **Taking well-founded decisions**
     - thanks to professional advice and consulting

   - Find precisely the right formwork solutions, with the aid of:
     - help with the bid invitation
     - in-depth analysis of the initial situation
     - objective evaluation of the planning, execution, and time-risks

2. **Bidding Stage**

   - **Optimising the preliminary work**
     - with Doka as an experienced partner

   - Draw up potentially winning bids, by:
     - basing them on realistically calculated guideline prices
     - making the right formwork choices
     - having an optimum time-calculation basis

3. **Project Management Planning Stage**

   - **Controlled, regular forming operations, for greater efficiency**
     - resulting from realistically calculated formwork concepts

   - Plan cost-effectively right from the outset, thanks to:
     - detailed offers
     - determination of the commissioning quantities
     - co-ordination of lead-times and handover deadlines
The advantages for you thanks to professional advice and consulting

- **Cost savings and time gains**
  When we advise and support you right from the word "go", we can make sure that the right formwork systems are chosen and then used as planned. This lets you achieve optimum utilisation of the formwork equipment, and effective forming operations because your workflows will be correct.

- **Maximised workplace safety**
  The advice and support we can give you in how to use the equipment correctly, and as planned, leads to greater safety on the job.

- **Transparency**
  Because our services and costs are completely transparent, there is no need for improvisation during the project – and no unpleasant surprises at the end of it.

- **Reduced close-out costs**
  Our professional advice on the selection, quality and correct use of the equipment helps you avoid damage, and minimise wear-and-tear.

**Concrete Construction Stage**

Optimum resource utilisation with assistance from the Doka Formwork Experts

Workflow optimisation, thanks to
- thorough utilisation planning
- internationally experienced project technicians
- appropriate transport logistics
- on-site support

**Project Close-out Stage**

Seeing things through to a positive conclusion with professional support

Doka Services are a byword for transparency and efficiency here, offering
- jointly handled return of rented formwork
- professional dismantling
- efficient cleaning and reconditioning using special equipment
System description

Dokaflex 30 tec -
the high-performing hand-set system for floor-slabs

With its combination of two high-capacity system components – the Doka composite formwork beams I tec 20 and the Doka Eurex floor prop – Dokaflex 30 tec is a high-performing hand-set formwork system.

Important note:
- The Doka beams I tec 20 are used as primary beams, and Doka beams 'H20 top' as the secondary beams.
- When planning Dokaflex 30 tec projects, remember the higher prop loads now allowed by the new official Approval.

Labour-cost savings

from using new, intelligent system components
Now you can cut costs even more!
- Up to 40% fewer floor props – meaning that much less time is needed for resetting and levelling
- Far fewer separate parts to be moved – so the workflows are even quicker
- The wide spacing between the primary beams leaves more space beneath the formwork for equipment-handling

Reduced equipment costs

thanks to maximum product optimisation
These advantages are “tops”
- Much lower equipment costs for the same commissioning quantity
- Longer service life and lower close-out costs with I tec 20 beams and 'Eurex top' floor props

Perfect logistics

thanks to optimised system development
Benefit right across the board!
- Based on existing system components
- Reduced storage and transport volumes
- Multi-functional system components that can also be used in other Doka formwork solutions

Simply by telescoping the I tec 20 primary beams and the 'H20 top' secondary beams, Dokaflex 30 tec adapts to any desired layout. The formwork is planned with a technical slide-rule, ensuring that it is optimally dimensioned for the slab thickness, clear height and room geometry involved.

Further advantages:
- infill zones are managed within the system, making it easy to accommodate walls and columns
- for shoring heights of up to 5.50 m
- any type of form-facing can be used
- optional increment grid, with markings, means there is no need to measure up

Dokaflex 30 tec is ideal for enclosed spaces where the formwork superstructure can rest up against walls on all sides.

Horizontal forces at exposed slab-edges, drop beams or steps in ceiling slabs must be restrained by strutting or back-stays.

Important note:
- When planning Dokaflex 30 tec projects, remember the higher prop loads now allowed by the new official Approval.
Small number of system components - all perfectly co-ordinated

(A) ProFrame panel

- special surface coating for superb-quality concrete faces
- can be used on both sides
- all-round edge protection for long lifespan
- improved workplace safety thanks to reduced risk of slippage
- easy to clean, with high-pressure spray cleaner
- space-saving storage and handling

1) Alternatively, it is also possible to use Doka formwork sheets 3-SO.

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

(B) Doka beam H20 top

- is used as the secondary beam. Characteristic feature: blue beam-end reinforcement
- integrated shock absorber on the beam end piece for reduced damage and long service life
- pre-defined positioning points as reference marks for setting-up and checking the formwork

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

(C) Doka beam I tec 20

- is used as the primary beam. Characteristic features: dark-grey beam-end reinforcement, grey web and grey plastic sheets on the flange
- integrated shock absorber on the beam end piece for reduced damage and long service life
- pre-defined positioning points as reference marks for setting-up and checking the formwork

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

WARNING

➤ Use only Doka beams I tec 20 as the primary beams! The spacings of the props and primary beams are dimensioned for the higher load-bearing capacity of this beam.
(D) Lowering head H20

- integrated quick-lowering function for minimising damage when striking
- stabilises the primary beams so that these cannot tip over on their sides

(E) Supporting head H20 DF

- easy to mount to the floor prop
- for fixing intermediate props to the primary beam

(F) Doka floor props Eurex

- approved / type-tested
- EN 1065-compliant prop
  (see the approval or type-test for in-depth information)
- high load-bearing capacity
- numbered pegging holes, for easier height adjustment
- special thread geometry, which makes the prop easier to release even when it is under high load
- elbowed fastening clamps, reducing the risk of injury and making the props easier to operate

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

Follow the directions in the "Floor props Eurex / Eurex top" User Information booklet!

(G) Removable folding tripod

- for holding floor props upright
- swing-out legs allow flexible placement in constricted situations such as along edges and in corners

☞ The Doka floor prop Eurex 20 top 700 is only allowed to be used with a limited extension length.

Follow the directions in the "Doka floor prop Eurex 20 top 700" User Information!
Structural design

Simple structural design

The spacings of the beams and floor props can be optimised using the technical slide-rule.

Spacing and positions of the component parts

Equipment usage can be fully optimised (see the section headed "Optimising the structural design with regard to equipment quantities").

An even more methodical and faster way of erecting the formwork is to site-specifically base the spacings on the 0.5 m grid shown by the spacing marks on the beams.

You can tell at a glance whether the formwork has been erected correctly, and without having to measure up. For examples of site-specific grids, see the "Practical examples".

Primary and secondary beams

The primary beams should be orientated at right angles to the direction of an uneven length/width of room (5 m, 7 m, 9 m, etc.). This makes more efficient use of the potential of the system.

Format of the formwork sheets

The ProFrame panels, in formats of 200x50cm and 250x50cm (21 or 27mm), have just the right dimensions to fit exactly into the increment-grid of the Dokaflex system.

- A Mark
- 1 mark = 0.5 m
- 2 marks = 1.0 m
- 2½ marks = 1.25 m
- 3 marks = 1.5 m
- 3½ marks = 1.75 m
- 4 marks = 2.0 m
Optimising the structural design with regard to equipment quantities

**Primary beams (Doka beams I tec 20):**
- Permitted bending moment: 9 kNm
- Permitted shear force: 20 kN
- Rigidity: 640 kNm²

**Secondary beams (Doka beams H20 top):**
- Permitted bending moment: 5 kNm
- Permitted shear force: 11 kN
- Rigidity: 450 kNm²

Instructions on how to use Tables 1 and 2 (on following pages) correctly:
- **In Table 1:**
  - with reference to the required supporting height, find out from this Table which types of floor prop are suitable, and what their **max. permitted prop load** is.
- **In Table 2:**
  - find the **max. permitted spacing of the primary beams** with reference to the slab thickness and the chosen spacing of the secondary beams (will depend upon the type of formwork sheet being used).
  - with reference to the selected permitted prop load and spacing of primary beams, find out from this Table the **max. permitted spacing of the props**.

Example: Slab thickness 30 cm
1. Selected spacing of secondary beams: 0.50 m (e.g. because of the type of formwork sheet)
2. Permitted spacing of primary beams: 2.62 m  → Value chosen: 2.50 m
3. For a permitted prop load of 25 kN:
   - max. spacing of props 1.09 m  → Value chosen: 1.00 m
4. For a permitted prop load of 35 kN:
   - max. spacing of props 1.53 m  → Value chosen: 1.50 m

**Practical examples**

**Spacing of props a = 1.00 m¹**

![Diagram](image1)

1) System grid 1-2-5 (markings on beams) for beam lengths of 4.90m and 3.90m

**Spacing of props a = 1.25 m**

![Diagram](image2)

**Spacing of props a = 1.50 m²**

![Diagram](image3)

2) System grid 1-3-5 (markings on beams) for beam lengths of 5.35m and 3.90m

**Spacing of props a = 1.75 m**

![Diagram](image4)

A "Main prop" (floor prop + Lowering head H20 + removable folding tripod)
B "Intermediate prop" (floor prop + Supporting head H20)
C Doka beam I tec 20 3.90m
D Doka beam I tec 20 4.90m
E Doka beam I tec 20 5.35m
### Table 1: Permitted prop loads [kN]

<table>
<thead>
<tr>
<th>Prop length [m]</th>
<th>Top or Bottom</th>
<th>Eurex 20 and Eurex 20 top</th>
<th>Eurex 30 and Eurex 30 top</th>
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<tbody>
<tr>
<td>150</td>
<td>D15</td>
<td>B25</td>
<td>C25</td>
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<tr>
<td>200</td>
<td>D25</td>
<td>C25</td>
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<td>300</td>
<td>D30</td>
<td>D30</td>
<td>C35</td>
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<td>C35</td>
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<tr>
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<td>C40</td>
<td>D40</td>
<td>C55</td>
</tr>
<tr>
<td>700</td>
<td>C55</td>
<td>C55</td>
<td>C70</td>
</tr>
</tbody>
</table>

- **Top or Bottom**: Indicates whether the position is at the top or bottom of the prop.
- **Position of outer tube**: Indicates the category of the prop according to EN 1065.
- **Permitted prop loads**: Values are given in kN for each prop length and position.

For example, for a prop length of 150 m, the permitted load at the top position is 20.6 kN, and at the bottom position is 21.3 kN.
In the case of cavity flat-slab floors, significantly lower slab loads occur.

Table 2: Dokaflex 30 tec

<table>
<thead>
<tr>
<th>Slab thickness [cm]</th>
<th>Slab load % [kN/m²]</th>
<th>Max. permitted spacing of primary beams a [m] for a secondary-beam spacing b [m] of 0.33</th>
<th>0.50</th>
<th>0.625</th>
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These values only apply when a Lowering head, 4-way head or Supporting head is used.

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Prop spacing < 0.50m or primary beams too widely spaced

1) In accordance with EN 12812, this allows for a service load of 0.75 kN/m² and a variable load of 10 % of a massive concrete floor-slab, totalling at least 0.75 kN/m² but no more than 1.75 kN/m² (assuming a unit weight of 2500 kg/m³ for the fresh concrete). Mid-span deflection has been limited to 1/500.

In the case of cavity flat-slab floors, significantly lower slab loads occur.
Instructions for assembly and use

Important note:
As well as the instructions given here, you MUST follow the instructions in ‘Reshoring props, concrete technology and stripping out’.

Closing the formwork

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

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

CAUTION
➤ If the floor props are transported with the lowering heads still attached, you must secure these with a Spring-locked connecting pin 16 mm to prevent them dropping out. This is particularly important when they are transported in the horizontal.

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

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

Putting up each removable folding tripod.
➤ Do not oil or grease wedge-clamped joins.
➤ Put the floor prop into the tripod and fix it in place with the clamping lever. Before stepping onto the formwork, check again to make sure that the props have been correctly fixed in the tripods.

Setting up tripods in corners or up against walls

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

b ... spacing of primary beams
x ... depending on the number of intermediate props, ‘x’ = 2, 3 or 4 times the prop spacing ‘a’ given in “Dimensioning”

Clearance a between wedge and head-plate: 6 cm
Inserting the primary beams

➤ Using beam-forks, place the primary beams into the lowering heads.

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

➤ Adjust the primary beams to the correct floor-slab height.

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

WARNING
➤ Use only Doka beams I tec 20 as the primary beams! The spacings of the props and primary beams are dimensioned for the higher load-bearing capacity of this beam.

Placing the secondary beams on the primary beams

➤ Use the beam forks to place the secondary beams on the primary beams, with an overlap.

➤ If it is planned to lay the panels on the secondary beams working from below, always lay only as many secondary beams in place as are needed for placing the next row of panels.

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

WARNING
➤ It is not permitted to set down any loads on the floor-slab formwork (e.g. beams, panels, reinforcements) until the intermediate props have been set up!
Fall-arrest protection at slab-edges
➤ Use the Doka floor end-shutter clamp to form the stop-ends and erect the fall-arrest barrier.

See the "Doka floor end-shutter clamp" User Information booklet for details.

Putting up the intermediate props
Usually, these are put up successively, under the area where the panels have just been placed.
➤ Place the Supporting head H20 DF on the inside tube of the floor prop and secure it with the integral spring-steel stirrup.

Important note:
➤ Put up the intermediate props so that they force-fit. It is not allowed to make some props higher than others!
➤ Put up the intermediate props.

Laying the ProFrame panels on the beams from below

Import note:
➤ To lay ProFrame panels on the secondary beams from below, always work from a Wheel-around scaffold DF, a Platform stairway 0.97m, standard mobile scaffold towers or a platform ladder.
➤ Lay the ProFrame panels at right angles to the secondary beams.

a ... spacing of props

A Supporting head H20 DF
B Doka beam I tec 20
C Hole in the supporting head
(for fixing with chipboard screw 4x35)
Laying the ProFrame panels on the beams from above

➤ Local regulations, or the result of a hazard assessment carried out by the erector, may make it necessary to use personal fall arrest systems (PFAS) when setting-up the formwork from above.

➤ Lay the ProFrame panels at right angles to the secondary beams.

Spray the ProFrame panels with parting agent.

Where necessary (e.g. edge zones), secure the form-ply with nails.

Recommended nail lengths
- sheet thickness 21 mm - approx. 50 mm
- sheet thickness 27 mm - approx. 60 mm

Windproofing
- For increased stability, in larger rooms, the full erection sequence of “primary beams + secondary beams + formwork sheets” should be carried out progressively for successive sub-areas of the room. When doing this, provide suitable bracing to walls or columns.
- If there is any risk of the formwork being blown over, all free-standing, non-enclosed areas of slab formwork must be secured during work-breaks and when work finishes for the day.

Pouring

To protect the surface of the form-facing, we recommend using a vibrator with a protective rubber cap.
**Stripping out**

Observe all stipulated stripping times!

**Removing the intermediate props**

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

After the intermediate props have been removed, only the main props (with the removable folding tripods) are left standing. This leaves enough space to manoeuvre wheel-around scaffolds and stacking pallets without difficulty.

**Wheel-around scaffold DF:**

- collapsible wheel-around platform made of light alloy
- variable working heights of up to 3.50 m (max. platform height 1.50 m)
- width of scaffold: 0.75 m
- When work is being carried out near drop-off edges (i.e. at a distance of < 2 m), the 'Wheel-around scaffold DF accessory set' (consisting of a toeboard and intermediate guardrail) is needed.

For greater heights, the Working scaffold Modul is ideal.

**Platform stairway 0.97m:**

- Wheel-around, fold-down platform stairway made of light alloy
- Working heights of up to 3.00 m (height of top step 0.97 m)
- Stair width: 1.20 m
- Minimum distance a from drop-off edge: 2.00 m
Lowering the floor-slab formwork
➤ Lower the floor-slab formwork by striking the wedge on the lowering head with a hammer.

Removing parts that are no longer needed
➤ Turn the secondary beams over onto their sides, pull them out and put them in the stacking pallet. Leave the beams under the panel-joints in place.
➤ Take out the ProFrame panels and put them in the stacking pallet.
➤ Remove the remaining secondary beams and the primary beams, and put them in the stacking pallet.

Removing the floor props
1) Hold the inner tube with one hand.
2) Open the fastening clamp to unfix the inner tube. Guide this by hand while lowering it into the outer tube.
➤ Put the removable folding tripods and props in the stacking pallet.

When lifting the equipment to the next storey, it is better to transport the floor props and the lowering heads separately (the floor props on their own can be stored much more space-savingly in the stacking pallet).

Reshoring
➤ Before pouring the next floor-slab (i.e. above the one that has just been stripped), put up reshoring props.
☞ For further information (number of props etc.), see "Reshoring props, concrete technology and striking"
Adaptability

Closures and adjustments

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

Grid and flexibility - in one system

Dokaflex also adapts to difficult layouts.

Adaptation along edge

<table>
<thead>
<tr>
<th>A</th>
<th>ProFrame panel</th>
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<tbody>
<tr>
<td>B</td>
<td>Fitting boards in the closure zone</td>
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The grain of the face layer (A) must run at right angles to the supports (B).
Secondary-beam stabilisers are used to prevent formwork beams tipping over while panels are being laid on them.

**Advantages:**
- Special claws to prevent slippage on the beam-flange
- No work-platform scaffold needed, as the stabilisers can be mounted/dismounted from ground level using an Alu beam fork H20
- Needs only small commissioning quantities, as the Secondary-beam stabilisers can be re-set in tandem with the formwork erection cycle:
  - approx. 20 Secondary-beam stabilisers 1
  - approx. 10 Secondary-beam stabilisers 2

**Note:**
In certain special situations, (e.g. when forming inclined floor-slabs), Secondary-beam stabilisers can also be used for transferring horizontal loads.
For more information, please contact your Doka technician.

**How to mount:**
- Hang the Secondary-beam stabilisers into place with an Alu beam fork H20.
- Lay the ProFrame panels on the beams.
- After the formwork sheets have been laid, unhook and remove the Secondary-beam stabilisers with an Alu beam fork H20.
Floor formwork around edges

It can be advantageous to combine Dokaflex with Dokamatic tables, particularly in edge-zones. This is an easy, safe way of forming drop-beams and slab stop-ends, and of erecting safety railings.

For more information, see the "Dokamatic table", "Dokaflex table", "Doka load-bearing tower Staxo 40" or "Doka load-bearing tower Staxo 100" User Information booklets.

Without edge drop-beam

Configuration with tableform

With edge drop-beam

Configuration with tableform

Supported by load-bearing tower

For downstand beams, the load-bearing towers and beam-forming supports can be combined very effectively with Dokaflex.

WARNING
➤ Where formwork beams cantilever out a long way, secure them against accidental lift-out.
Using Dokaflex on edge zones

If no separate edge tables are available, the following points must be remembered when using Dokaflex:

▪ In order to be able to transfer the horizontal forces, the superstructure components must be firmly attached to one another.
▪ The back-stay can be fastened to either the secondary or primary beam.

**WARNING**

➤ For work at dangerous heights, the secondary-beam elements with the working platforms must be preassembled on the ground.
➤ Where working platforms are erected on cantilevering floor-slab formwork, the formwork must be secured against accidental lift-out.
➤ Secondary beams with stop-end formwork must be secured against horizontal pull-out.
➤ In addition, put up a protection platform on the structure, e.g. Folding platform K
Tie-back solutions

For transferring low horizontal loads (stabilisation, V/100, windproofing etc.).

**To a beam-hole**

Tie-back attached to a diam. 20 mm tie-rod or reinforcement rod placed through a beam-hole

- Max. tie-back load: 5 kN

**Lifting-bracket**

Pre-mounted to primary beam.

- Max. tie-back load: 5 kN

**Around formwork beam and Lowering head H20**

- Max. tie-back load: 5 kN

---

**WARNING**

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

---

H Horizontal load
V Vertical load
A Back-stay force

A Lashing strap 5.00m
B Diam. 20 mm tie-rod or reinforcement rod

A Lashing strap 5.00m
D Lifting-bracket

A Lashing strap 5.00m
Bracing clamp B

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

Important note:
- The Bracing clamp B is only intended as a set-up aid and is not suitable for sustaining horizontal loads.
- Always hammer in the wedge from top to bottom!

Possible plank/floor-prop combinations with the Bracing clamp B

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When used in conjunction with the Floor prop Eurex 20 top 700, please refer to the User Information booklet for this system.

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Legend:
- **IT** Inner tube
- **OT** Outer tube
- ✓ Possible to combine
- — Not possible to combine
**Slab stop-ends**

**Universal end-shutter support 30cm**

**Configuration A: Fastened with nails**

- A Universal end-shutter support 30cm
- B Nail 3.1x80
- C Doka formwork sheet 3-SO

**Tip for striking formwork:**

- Take out the nails on the stop-end side.
- Put the claw of a hammer under the corner (put a piece of wood under it to protect the formwork sheeting)
- Lever up the end-shutter support

**Configuration B: Fastened with Spax screws**

- A Universal end-shutter support 30cm
- C Doka formwork sheet 3-SO
- D Spax screws 4x40 (fully threaded)
- E Doka beam H20

**Structural design**

<table>
<thead>
<tr>
<th>How fastened:</th>
<th>Configuration</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 nails 3.1x80</td>
<td>A</td>
<td>90</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>4 Spax screws 4x40 (fully threaded)</td>
<td>B</td>
<td>220</td>
<td>190</td>
<td>160</td>
</tr>
</tbody>
</table>
Doka floor end-shutter clamp

The Doka floor end-shutter clamp is used for fast, safe forming of slab stop-ends.
- For slab thicknesses of up to 60 cm
- 3 different fixing methods
- Various types of stop-end are possible
- Fits all standard Doka handrail posts (also complies with the requirements of DIN EN 13374)
- Can be mounted and dismounted from either above or below when the End-shutter shoe is used
- Low unit weight (can be separated into 2 parts)

Follow the directions in the "Doka floor end-shutter clamp" User Information booklet!

System dimensions

Practical example

Note:
The edge railings must be mounted before the formwork sheets are laid out.
Fall-arrest systems on the structure

**Doka floor end-shutter clamp**
- Slab stop-ends and fall-arrest barriers in one system

Follow the directions in the "Doka floor end-shutter clamp" User Information booklet!

**Handrail post XP 1.20m**
- Attached with Screw-on shoe XP, railing clamp, Handrail-post shoe or Step bracket XP
- Protective grating XP, guard-rail boards or scaffold tubes can be used as the safety barrier

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

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

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

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

Follow the directions in the "Handrail clamp T" 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

Follow the directions in the "Handrail post 1.10m" User Information!
Beam forming support

The Beam forming support 20 is the professional way of forming drop beams and slab stop-ends. In conjunction with the "Extension 60 cm for beam support", exact height adjustment to within 1 cm is possible. This does away with time-consuming jobsite squared-timber constructions. The Beam forming support automatically clamps the formwork tight, resulting in clean concrete surfaces and grout-tight edges.

How to use the Beam forming support

➤ Place the Beam-forming support onto the H 20 secondary beam and push it up against the sidewall formwork.

The large bearing surface of the Beam-forming support gives the sidewall formwork a high degree of (90°) angle accuracy.

➤ Clamp the Beam forming support firmly into position

The diagonal bracing of the Beam-forming support ensures that the joint between the form-ply sheets is automatically pressed together tightly when the Beam forming support is clamped. This results in a clean concrete surface.

Formwork beams horizontal

(up to a height of 60 cm)

Note:
As a basic rule, it is forbidden to use formwork beams "horizontally" (i.e. with the load-direction perpendicular to the web). However, the specific applications shown here, using the Beam forming support, are permitted.

Formwork beams vertical

(up to a height of 90 cm)
Drop-beam not integrated into the floor-slab / stop-end formwork

All the data below apply where 3-SO 21 mm and 3-SO 27 mm formwork sheets are used.

Drop beams of between 10 and 30 cm in height

Drop beams of between 30 and 47 cm in height

Drop beams of between 47 and 70 cm in height

Drop beams of between 70 and 90 cm in height

Where the dimensional requirements are especially stringent, we recommend placing a form-tie (A) through the sidewall formwork as an additional precaution.

Sidewall formwork:
- Doka formwork beams H20 in the upright

<table>
<thead>
<tr>
<th>h</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 85 cm</td>
<td>41.7 cm</td>
<td>On every secondary beam</td>
</tr>
<tr>
<td>From 85 cm</td>
<td>36.0 cm</td>
<td>On every secondary beam</td>
</tr>
</tbody>
</table>
Drop-beam integrated into the floor-slab

**Secondary beams parallel to drop-beam**

All the data below apply where 3-SO 21 mm and 3-SO 27 mm formwork sheets are used.

**Drop beams of between 10 and 30 cm in height**

![Diagram of drop beam integrated into floor-slab]

- **b** ... max. 100 cm
- **l** ... max. 150 cm

**Base formwork**
- Height of squared timber = 30-h (cm)

**Sidewall formwork:**
- **Doka beam H20 top**
- **Squared timber 10/8 cm**

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>62.5 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>41.7 cm</td>
<td>On every 3rd secondary beam</td>
</tr>
</tbody>
</table>

**Drop beams of between 30 and 47 cm in height**

![Diagram of drop beam integrated into floor-slab]

- **b** ... max. 100 cm
- **l** ... max. 150 cm

**Sidewall formwork:**
- **Doka beam H20 top**
- **Squared timber 4/8 cm for drop beams between 30 and 34 cm in height**
- **Squared timber 8/8 cm for drop beams between 34 and 47 cm in height**

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>62.5 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>41.7 cm</td>
<td>On every 3rd secondary beam</td>
</tr>
</tbody>
</table>

**Drop beams of between 47 and 60 cm in height**

![Diagram of drop beam integrated into floor-slab]

- **b** ... max. 100 cm
- **l** ... max. 150 cm

**Sidewall formwork:**
- **2 Doka beams H20 top**

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>31.25 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>25.00 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
</tbody>
</table>

**Drop beams of between 60 and 70 cm in height**

![Diagram of drop beam integrated into floor-slab]

- **b** ... max. 100 cm
- **l** ... max. 150 cm

**Sidewall formwork:**
- **2 Doka beams H20 top**
- **Height of squared timber = h-60 (cm)**

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>40.0 cm</td>
<td>On every secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

---

999803902 - 06/2014 35
Secondary beams perpendicular to drop-beam

All the data below apply where 3-SO 21 mm and 3-SO 27 mm formwork sheets are used. Floor influence zone on either side of the drop-beam max. 1.0 m

Drop beams of between 10 and 30 cm in height

Base formwork
- Height of squared timber = 30-h (cm)

Sidewall formwork:
- Doka beam H20 top
- Squared timber 10/8 cm

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>62.5 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>41.7 cm</td>
<td>On every 3rd secondary beam</td>
</tr>
</tbody>
</table>

Drop beams of between 30 and 40 cm in height

Sidewall formwork:
- Doka beam H20 top
- Height of squared timber = h-20 (cm)

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>50.0 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>41.7 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
</tbody>
</table>

Drop beams of between 40 and 51 cm in height

Sidewall formwork:
- Doka beam H20 top
- Height of squared timber = h-40 (cm)

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>41.70 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>31.25 cm</td>
<td>On every 2nd secondary beam</td>
</tr>
</tbody>
</table>

Drop beams of between 51 and 70 cm in height

Sidewall formwork:
- Doka beam H20 top
- Squared timber 5/8 cm for drop beams of between 51 and 60 cm in height
- Squared timber 10/8 cm for drop beams of between 60 and 70 cm in height

<table>
<thead>
<tr>
<th>Slab thickness d</th>
<th>Spacing of secondary beams</th>
<th>Position of Beam forming support</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 cm</td>
<td>40.0 cm</td>
<td>On every secondary beam</td>
</tr>
<tr>
<td>30 cm</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

h... Drop-beam height
b... Drop-beam width
l... Spacing of primary beams
Combining Doka table systems

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

Dokamatic and Dokaflex tables

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

For more information, see the "Dokamatic table", "Dokaflex table", "Doka load-bearing tower Staxo 40" or "Doka load-bearing tower Staxo 100" User Information booklets.
Formwork planning with Tipos-Doka

**Tipos-Doka helps you to form even more efficiently**

Tipos-Doka has been developed to assist you in planning the use of your Doka formwork. For wall formwork, floor formwork and platforms, it puts the same tools into your hands that we at Doka use ourselves for formwork planning.

**Easy to use, fast and accurate results**

The easy-to-use interface makes for very fast working. From when you input your layout (with the "Schaligel"® on-screen assistant), all the way through to when you manually put the finishing touches to the formwork solution the program gives you. All this saves time - yours.

The program contains a large number of templates and wizards, so you can be sure of always getting the optimum technical and economical solution to your formwork task. This makes for greater operational reliability, and cuts costs.

You can get to work right away with the piece-lists, plans, views, sections and perspective drawings that the program gives you. Operational reliability is also enhanced by the high level of detail of the plans.

**Always the right quantities of formwork and accessories**

You can import the automatically generated piece-lists into many other programs for further processing.

Formwork components and accessories that have to be organised at short notice, or replaced by improvisation, are the ones that cost the most. This is why Tipos-Doka offers complete piece-lists that leave no room for improvisation. Planning with Tipos-Doka eliminates costs before they have a chance to even arise. And your depot can make the best possible use of its stocks.
Transporting, stacking and storing

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 devices for small items:
▪ durable
▪ stackable

Suitable transport appliances:
▪ crane
▪ pallet stacking truck
▪ forklift truck

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

Max. load: 700 kg
Permitted imposed load: 3150 kg

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

Lifting by crane

- Only lift the boxes when their sidewalls are closed!

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread-angle β max. 30°!

Repositioning by forklift truck or pallet stacking truck

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

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Repositioning by forklift truck or pallet stacking truck

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

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

Max. n° of boxes on top of one another

<table>
<thead>
<tr>
<th>Outdoors (on the site)</th>
<th>Indoors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor gradient up to 3%</td>
<td>Floor gradient up to 1%</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

It is not allowed to stack empty pallets on top of one another!
Doka multi-trip transport box 1.20x0.80m galv.

Storage and transport devices for small items:
- durable
- stackable

Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

Max. load: 1500 kg
Permitted imposed load: 7900 kg

Possible ways of dividing the box

<table>
<thead>
<tr>
<th>Multi-trip transport box partition</th>
<th>Lengthways</th>
<th>Crossways</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.20m max. 3 partitions</td>
<td>-</td>
<td>max. 3 partitions</td>
</tr>
<tr>
<td>0.80m -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using Doka multi-trip transport boxes as storage units

Max. n° of boxes on top of one another

<table>
<thead>
<tr>
<th>Outdoors (on the site)</th>
<th>Indoors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor gradient up to 3%</td>
<td>Floor gradient up to 1%</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

It is not allowed to stack empty pallets on top of one another!

Using Doka multi-trip transport boxes as transport devices

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

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:
▪ durable
▪ stackable

Suitable transport appliances:
▪ crane
▪ pallet stacking truck
▪ forklift truck

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

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

Using Doka stacking pallets as transport devices

Lifting by crane

▪ Multi-trip packaging items may only be lifted one at a time.
▪ Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m).
Do not exceed the permitted load-bearing capacity.
▪ Load the items centrically.
▪ Fasten the load to the stacking pallet so that it cannot slide or tip out.
▪ When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in these Operating Instructions!
▪ Spread-angle $\beta$ max. 30°!

Repositioning by forklift truck or pallet stacking truck

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

Using Doka stacking pallets as storage units

Max. load: 1100 kg
Permitted imposed load: 5900 kg

▪ Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
▪ Rating plate must be in place and clearly legible

Max. n° of units on top of one another

<table>
<thead>
<tr>
<th></th>
<th>Outdoors (on the site)</th>
<th>Indoors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor gradient</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>to 3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor gradient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>up to 1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is not allowed to stack empty pallets on top of one another!

How to use with bolt-on castor set:
Always apply the fixing brake when the container is "parked".
When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.
Doka accessory box

Storage and transport devices for small items:
- durable
- stackable

Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

The Doka accessory box is the tidy, easy-to-find way of storing and stacking all interconnection and form-tie components.

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

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

---

Doka accessory box as transport devices

Lifting by crane

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in these Operating Instructions!
- Spread-angle $\beta$ max. 30°!

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 caster set B turns the stacking pallet into a fast and manoeuvrable transport trolley.

Suitable for drive-through access openings $> 90$ cm.

The Bolt-on caster set B can be mounted to the following multi-trip packaging items:
- Doka accessory box
- Doka stacking pallets

Follow the directions in the Operating Instructions!

---

Doka accessory box as storage units

Max. n° of boxes on top of one another

<table>
<thead>
<tr>
<th>Outdoors (on the site)</th>
<th>Indoors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor gradient up to 3%</td>
<td>Floor gradient up to 1%</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

It is not allowed to stack empty pallets on top of one another!

How to use with bolt-on castor set:
Always apply the fixing brake when the container is "parked".
When Doka accessory boxes are stacked, the bottom box must NOT be one with a bolt-on castor set mounted to it.
Stacking strap 50

The Stacking strap 50 is the tidy, space-saving way of storing and handling ProFrame panels.

Packaging unit: 2 units

- The Stacking strap 50 is three things in one - base rest profile, lashing strap and edge protection.
- ProFrame panels are delivered ex-works strapped together with Stacking straps 50. Two Stacking straps 50 are needed per stack of panels.

ProFrame panels 21mm 50 units
ProFrame panels 27mm 40 units

- It can also be used in conjunction with the wheel-around Doka stacking pallet (for handling stacks of panels with no need for a crane).
Reshoring props, concrete technology and stripping out

Follow the directions in the Calculation Guide entitled 'Stripping out formwork from floors in building construction', and/or ask your Doka technician.

Why put up reshoring props after stripping out the formwork?

After the formwork has been stripped out and the slab has been stress-relieved or deshored, the slab is able to bear its own weight and live loads resulting from the construction state, but not the concreting loads from subsequent floor-slabs.

The temporary reshoring serves to support the floor-slab and distribute the concreting loads across several floors.

Positioning the reshoring props correctly

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

Ask an expert!

As a rule, the question of using reshoring props should be referred to the responsible experts, regardless of the information given above. Observe all local Standards and regulations!

Strength development in the new concrete

Rough reference values can be found in DIN 1045-3:2008, Table 2. The length of time until 50 percent of the final (28-day) strength is reached can be read off from this Table as a function of the temperature and the type of concrete.

The values are only valid if the concrete is given correct, appropriate curing throughout the entire period. For a concrete with medium strength development, the following inferred diagram may thus be used.

Concrete-strength development – medium

---

When is the best time to strip out the formwork?

The concrete strength needed before the formwork can be stripped out will depend upon the load factor $\alpha$. This can be read off from the following table.

Load factor $\alpha$

This is calculated by:

$$\alpha = \frac{OW_D + LL_{\text{construction state}}}{OW_D + OW_{\text{finishing}} + LL_{\text{final state}}}$$

<table>
<thead>
<tr>
<th>Slab thickness 'd' [m]</th>
<th>Dead-weight load $OW_D$ [kN/m²]</th>
<th>2.00 kN/m²</th>
<th>3.00 kN/m²</th>
<th>4.00 kN/m²</th>
<th>5.00 kN/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.14</td>
<td>3.50</td>
<td>0.67</td>
<td>0.59</td>
<td>0.53</td>
<td>0.48</td>
</tr>
<tr>
<td>0.16</td>
<td>4.00</td>
<td>0.69</td>
<td>0.61</td>
<td>0.55</td>
<td>0.50</td>
</tr>
<tr>
<td>0.18</td>
<td>4.50</td>
<td>0.71</td>
<td>0.63</td>
<td>0.57</td>
<td>0.52</td>
</tr>
<tr>
<td>0.20</td>
<td>5.00</td>
<td>0.72</td>
<td>0.65</td>
<td>0.59</td>
<td>0.54</td>
</tr>
<tr>
<td>0.22</td>
<td>5.50</td>
<td>0.74</td>
<td>0.67</td>
<td>0.61</td>
<td>0.56</td>
</tr>
<tr>
<td>0.25</td>
<td>6.25</td>
<td>0.76</td>
<td>0.69</td>
<td>0.63</td>
<td>0.58</td>
</tr>
<tr>
<td>0.30</td>
<td>7.50</td>
<td>0.78</td>
<td>0.72</td>
<td>0.67</td>
<td>0.62</td>
</tr>
<tr>
<td>0.35</td>
<td>8.75</td>
<td>0.80</td>
<td>0.75</td>
<td>0.69</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Valid for a finishing-load $OW_{\text{finishing}} = 2.00$ kN/m² and a live load in the early-stripped state of $LL_{\text{construction state}} = 1.50$ kN/m²

$OW_D$: calculated with $\gamma_{\text{concrete}} = 25$ kN/m³

$OW_{\text{finishing}}$: load for floor finish, etc.

Example: Slab thickness 0.20 m with a final live load of 5.00 kN/m² results in a load factor $\alpha$ of 0.54.

This means that formwork removal / stress-release can take place once the concrete has reached 54% of its 28-day strength. The load-bearing capacity will then correspond to that of the finished structure.

Important note:

If the floor props are not stress-relieved, meaning that the slab has not been activated, then the props will remain loaded with the dead weight of the floor-slab.

When the floor above is concreted, this may lead to a doubling of the load that is being applied to the floor props.

The floor props are not designed to cope with such an overload, and the result may be damage to the formwork, the floor props and the structure.

---

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☞ Ask an expert!

As a rule, the question of using reshoring props should be referred to the responsible experts, regardless of the information given above. Observe all local Standards and regulations!
Deflection of the new concrete

The modulus of elasticity of the concrete has already reached more than 90% of the 28-day value after only 3 days, regardless of the formulation of the concrete. The increase in the elastic deformation taking place in the new concrete is thus only negligible. The creep deformation, which only finally ceases after several years, is several times more than the elastic deformation.

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

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

Cracks in new concrete

The bonding strength between the reinforcement steel and the concrete develops more rapidly in the new concrete than does its compressive strength. This means that early stripping does not have any negative influence upon the size and distribution of cracks on the tension side of reinforced concrete constructions. Other cracking phenomena can be countered effectively by appropriate curing methods.

Curing of new concrete

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

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

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

Removing the load from the formwork from wide-spanned floor-slabs with support centres of over 7.5m

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

- When the load is taken off the floor props, the floor props that are still in place are briefly subjected to additional loads. This may lead to overloading, and to the floor props being damaged.
- Please consult your Doka technician.

The basic rule is:

- Stress-release should always be carried out working from one side towards the other, or from the middle of the floor slab (mid-span) towards the slab-edges.

For wide spans, this procedure MUST be followed!

- Stress-release must NEVER be carried out from both sides towards the middle!
### Component overview

<table>
<thead>
<tr>
<th>Article n°</th>
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<th>Description</th>
<th>Article n°</th>
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**User Information Dokaflex 30 tec**

- **Stützbein top**
  - Galvanised
  - Height: 80 cm
  - Delivery condition: folded closed

- **Stützbein**
  - Galvanised
  - Height: 80 cm
  - Delivery condition: folded closed

- **Stützbein 1,20m**
  - Galvanised
  - Height: 120 cm
  - Delivery condition: folded closed

- **Galvanised**
  - Height: 80 cm
  - Delivery condition: folded closed

- **Galvanised**
  - Height: 120 cm
  - Delivery condition: folded closed
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Aluminium
Length: 185 cm
Width: 80 cm
Height: 255 cm
Delivery condition: folded closed

Timber parts varnished yellow
Length: 189 cm

Galvanised
Length: 75.5 cm

Aluminium
Length: 176 cm

Galvanised
Height: 38.7 cm

Galvanised
Height: 123 - 171 cm
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### Handrail post 1.10m
- **Article n°**: 584384000
- **Component overview**: Handrail post 1.10m
- **Description**: Galvanised
- **Height**: 134 cm

### Attachable sleeve 24mm
- **Article n°**: 584385000
- **Component overview**: Attachable sleeve 24mm
- **Description**: Grey
- **Length**: 16.5 cm
- **Diameter**: 2.7 cm

### Screw sleeve 20.0
- **Article n°**: 584386000
- **Component overview**: Screw sleeve 20.0
- **Description**: Yellow
- **Length**: 20 cm
- **Diameter**: 3.1 cm

### Scaffold tube 48.3mm
- **Multi-trip packaging**
  - **Article n°**: 584386000
  - **Component overview**: Scaffold tube 48.3mm
  - **Description**: Galvanised
  - **Height**: 134 cm

### Screw-on coupler 48mm 50
- **Article n°**: 682020000
- **Component overview**: Screw-on coupler 48mm 50
- **Description**: Galvanised
- **Width-across**: 22 mm
- **Follow fitting instructions!**
### Component overview

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Near to you, worldwide

Doka is one of the world leaders in developing, manufacturing and distributing formwork technology for use in all fields of the construction sector. With more than 160 sales and logistics facilities in over 70 countries, the Doka Group has a highly efficient distribution network which ensures that equipment and technical support are provided swiftly and professionally. An enterprise forming part of the Umdasch Group, the Doka Group employs a worldwide workforce of more than 5600.