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en-GB

The Formwork Experts.

Forming fair-faced concrete

User Information

Contents

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 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 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.

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.

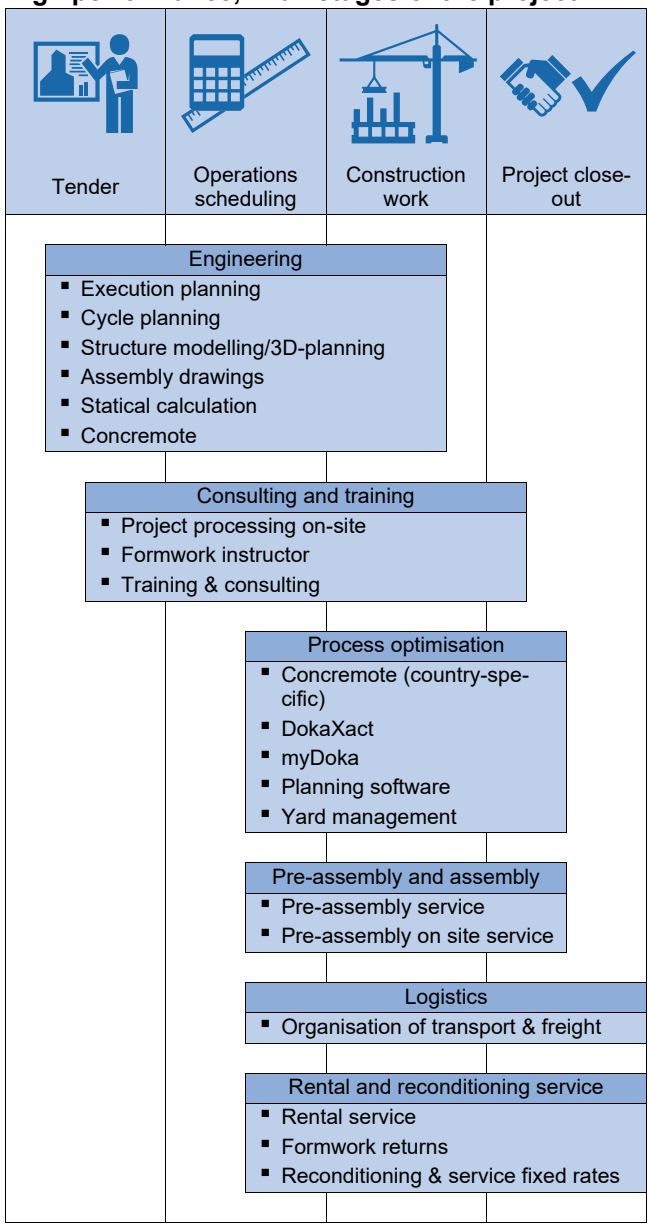
Just-in-time availability

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



Digital Services
for higher productivity in construction

From planning to completion of construction - with our digital services we want to set the pace for boosting productivity in construction. Our digital portfolio includes solutions for planning, procuring and managing to performing on site. Learn more about our digital offer at doka.com/digital.

Foreword

With this User Information booklet, Doka aims to give both planners and site crews practical help and support with the job of forming and casting fair-faced concrete building elements. The primary focus in this document is on the requirements of site crews.

Fair-faced concrete structures

Fair-faced concrete structures are modern-day, one-of-a-kind builds characterised by freedom of design in terms of geometry and surface texturing (within the framework of the technically possible).

Requirements

When it comes to constructing fair-faced concrete structures and carrying out projects of this nature, a great deal of high-quality experience is needed, in terms of both costing and planning and actual workmanship.

Doka experience

Our wealth of experience of fair-faced concrete construction accumulated over many years on sites all over the world enables us to give you the following systematic, practical tips on how to work with our formwork systems.

Surfaces

As well as aspects like the overall functionality and use of space in a project, on fair-faced concrete builds it is the visible surfaces and their visual impact which play the biggest role. These surfaces have a crucial architectural function and so are often referred to as "concrete faces subject to special requirements regarding appearance" or "architectural surfaces".

In our opinion, if the finished architectural surfaces are to meet the expectations of both the architect and the client, it is essential to think through the necessary work steps and lead-times beforehand from the points of view of all the stakeholders.

Fair-faced concrete formwork

Fair-faced concrete formwork has to meet special quality requirements, so special cost factors also apply.

Doka products

For information about the availability of the products shown, please do not hesitate to consult the nearest branch office or the field sales representative responsible.

Directives and Standards

Specific requirements applying to concrete surfaces can vary widely, depending on regional technical construction codes[1)] and architectural preferences. Consequently, the suitability of particular formwork systems always has to be checked and finalised on a project-specific basis.

For this reason, it is advisable to begin by constructing a test wall or slab in advance to verify the interplay of all the factors involved. The result is then documented and submitted to all stakeholders for approval.

[1)] e.g. Germany's 'Merkblatt Sichtbeton' (Bulletin for Fair-faced Concrete) issued by the German Concrete and Construction Technology Association (Deutscher Beton- und Bautechnik Verein, DBV), the 'Sichtbeton - Geschalte Betonflächen' (Fair-faced Concrete - Formed Concrete Surfaces) guideline issued by the Österreichische Vereinigung für Beton- und Betontechnik, the ÖVBB, the counterpart of the DBV in Austria, or equivalent publications in other countries

Checklist sequence

Fair-faced concrete requires teamwork and the commitment of everyone involved. It is advisable to gather all the key players round the table to discuss the steps needed and the procedures that must be followed to make good results achievable.

Our tips, instructions and recommendations below can doubtless contribute to a successful outcome, but they have to be viewed as part of the big picture, in context with your own experience of concrete construction. They make no claim to completeness.

For details of the support we can offer over and above the practical advice in this booklet, see the section headed 'Doka services'.

Link to the 'Change over time in the appearance of the concrete' video:

Click here...

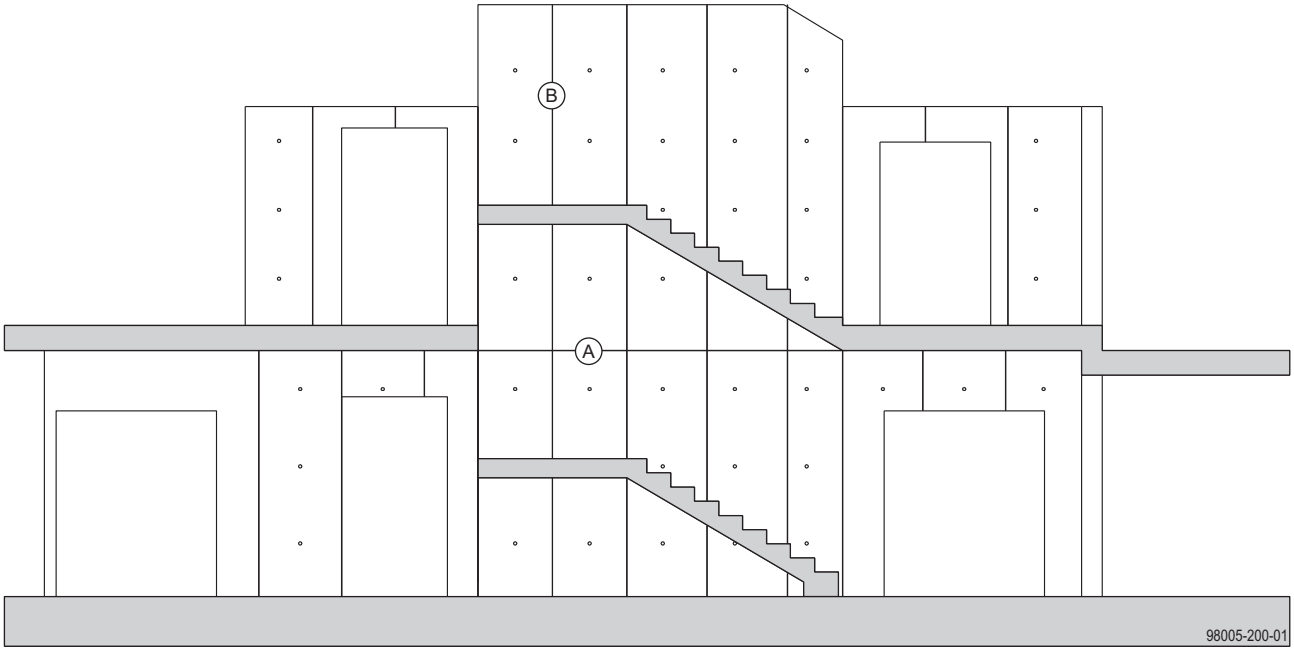
Surface design

Planning documents

Before you commence preparations for forming high-quality fair-faced concrete surfaces, you should address the following points:

- valid (i.e. approved) planning documents, preferably in digital form
- if possible, building shell plans (showing only the load-bearing walls and floor-slabs)
- establishing exactly which surfaces are to be executed in fair-faced concrete
- defining the formwork pattern on the basis of the tender documents
- agreeing the elevation plans with layouts and sections (interruptions in the architectural surfaces due to adjoining walls and floor-slabs)
- allowing for fixtures affecting the architectural surfaces (lighting, pipework, spacers including closures, etc.)
- deciding on the construction joints, with the concurrence of the structural engineer
- discussions with everyone involved in construction and in producing the visible surfaces
- clarifying which surface-quality specifications will require a lot of extra work, and which only a little

Example: Architectural surface in stairwell



A Construction joint
B Inter-panel joint in the formwork

Joints

Walls

The joints required by the planner/structural engineer and those necessitated by the workflow are created in different ways in terms of the formwork.

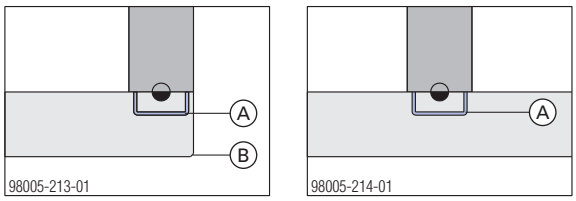
- **Joint between form-ply sheets:** Joint between two abutting sheets of a formwork panel
- **Inter-panel joint:** Joint between two adjoining formwork panels
- **Construction joint:** Joint between pouring sections, made necessary by the construction workflow or required for statical reasons

The various types of joint show up differently on the finished concrete surface. In fair-faced concreting, construction joints in particular require special consideration.

Regarding the arrangement of construction joints, the following have to be agreed with the planner and structural engineer:

- Will the corners and wall junctions have to be formed in a single pouring section or can the walls be resolved into separate shear walls?
- What maximum wall lengths will be poured in a single pouring section? Where will construction joints be needed, and where are they possible in the architectural surface?

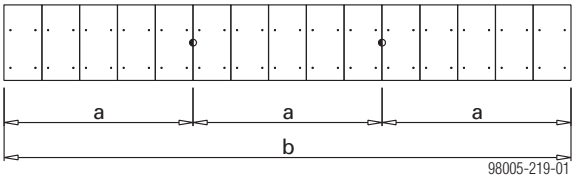
Plan view:



Left: Wall without corner
Right: Wall junction subsequently formed

A	Reinforcement connection
B	Triangular ledge

Elevation view:

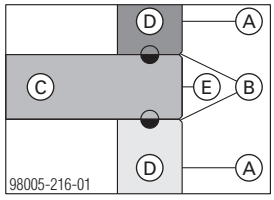


a ... Length of pouring section
b ... Overall length of fair-faced concrete wall

Floor-slabs

- Will it be possible to have reinforcement connections in the floor-slab, meaning that you can choose where to locate the construction joints, or will the individual structure members have to be "poured-in-one"?
- Is it acceptable for the end face of the floor-slab to remain visible through the construction joints?

Section view:

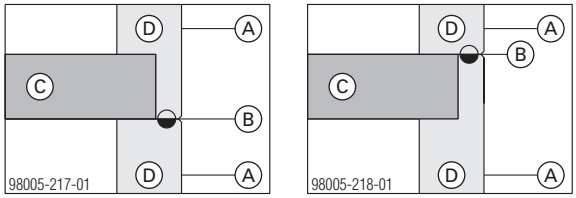


Wall-to-slab construction joints

A	View of surface of wall
B	Triangular ledge or trapezoidal ledge
C	Floor-slab
D	Wall
E	View of end face of floor-slab

- If the end face of the floor-slab is not intended to be visible, the construction joint can be at either the bottom or top edge of the slab.

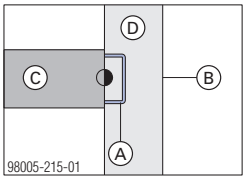
Section view:



Left: Construction joint at bottom edge of slab
Right: Construction joint at top edge of slab

A	View of surface of wall
B	Triangular ledge
C	Floor-slab
D	Wall

Example: Section joints in wall - independent of the floor-slab level



Floor-slab with reinforcement connection

A	Reinforcement connection
B	View of surface of wall
C	Floor-slab
D	Wall

Form-facing

The formwork sheeting is the part of the formwork with which the visual effect of the fair-faced concrete surface (texture, colouring) can be influenced. These two factors can be changed by different types of formwork sheeting.

The types of formwork sheeting are outlined below in categories ranging from strongly absorbent (boards) to non-absorbent (plastic, steel etc.).

Boards, rough-cut

Board surface

Concrete finish

Features:

- Rough, board-like surface structure with dark concrete colour
- Lighter after several use cycles
- Extremely absorbent
- Virtually no pores in visible surface
- Variations in absorbency due to knots, resin pockets, etc.
- Wood sugar partially prevents concrete hardening
- Sanding on surface
- Wood fibres might adhere to the surface.

Note:

Imprint of the structure and appearance of the concrete surface might alter slightly from one usage cycle to the next.

- Using boards cut on a gang saw instead of a circular saw (depending on availability) produces parallel rather than crescent-shaped imprints.
- Treat boards that have not yet been used and replacement boards with cement slurry (see the section headed ‘Pre-treatment of the formwork’).
- To prevent differences in colour, it is advisable to use the same cement as will subsequently be used in the concrete.

Boards, planed

Board surface

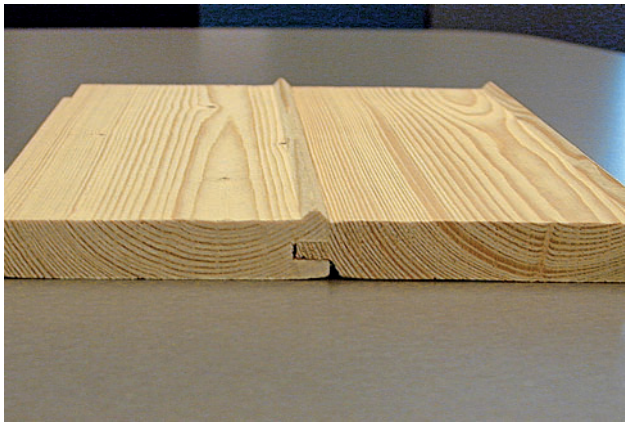
Concrete finish

Features:

- Smooth surface with wood texture
- Dark-coloured concrete
- Lighter colour after several use cycles
- Few pores
- Variations in absorbency due to knots, resin pockets, etc.
- Wood sugar partially prevents concrete hardening
- Sanding on surface

Treat boards that have not yet been used and replacement boards with cement slurry (see the section headed ‘Pre-treatment of the formwork’).

Boards, profiled



Surface of board

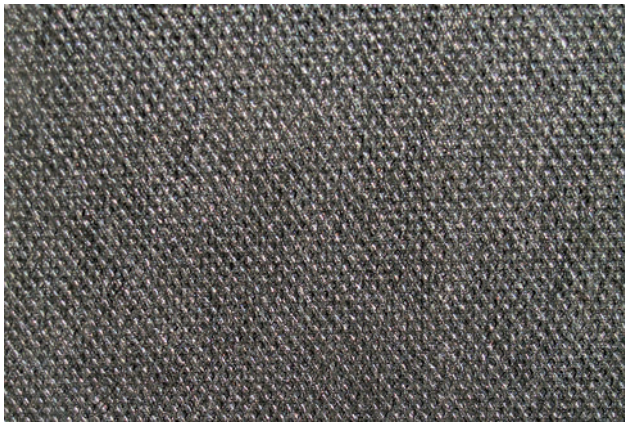
Concrete finish

Features:

- Sharply structured surface (projections or recesses, depending on the profile)
- No bleeding of the concrete at butt joints between boards (tongue and groove keeps the joints tight)
- Deeply imprinted board-type surface structure
- Dark-coloured concrete
- Lighter colour after several use cycles
- Few pores
- Variations in absorbency due to knots, resin pockets, etc.
- Wood sugar partially prevents concrete hardening
- Sanding on surface

Treat uncoated boards that have not yet been used and replacement boards with cement slurry (see the section headed ‘Pre-treatment of the formwork’).

Drainage felt



Filter-fleece surface

Concrete finish

Features:

- Plastic sheeting with screen-printed structure
- Surface water and air are carried away from the fresh concrete
- Cement paste concentration at the surface
- Dark concrete surfaces
- Virtually no pores
- Stretching the sheeting over the formwork is labour-intensive
- Not actually intended for fair-faced concrete as such, but for construction of sewage treatment plants and power plants (concrete subsequently subjected to high mechanical load or chemical exposure).
- No release agent can be used, so high effort involved in striking the formwork (concrete adhesion)
- Can generally be used only once
- High additional material and labour costs
- High risk of rippling

Note:

When used to produce fair-faced concrete surfaces, the filter fleece has to be glued to an additional layer of formwork sheeting and this extra sheeting screwed to the form facing from behind.

Sheets made of derived timber product (e.g. chipboard)

Sheet surface

Concrete finish

Features:

- Waterproof glue-bonded formwork sheet
- Usually multi-layered construction
- Strongly absorbent when not coated
- Slightly rough surface
- Tends to cause staining
- Lasts for only a small number of use cycles
- Virtually no pores
- Edges very damage-prone

OSB sheets

Sheet surface

Concrete finish

Features:

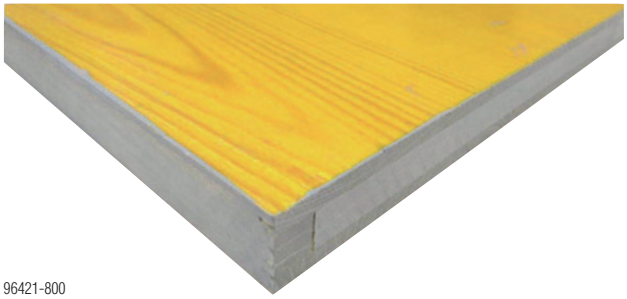
- Smooth surface with clear imprint of the sheets' structure
- Rough, board-like surface structure with dark concrete colour
- Lighter colour after several use cycles
- Variations in absorbency
- Virtually no pores in visible surface
- Wood sugar partially prevents concrete hardening
- Sanding on surface
- Wood fibres might adhere to the surface.

Note:

Imprint of the structure and appearance of the concrete surface might alter slightly from one usage cycle to the next.

- Treat sheets that have not yet been used and replacement sheets with cement slurry (see the section headed 'Pre-treatment of the formwork').
- To prevent differences in colour, it is advisable to use the same cement as will subsequently be used in the concrete.

Doka formwork sheet 3S top

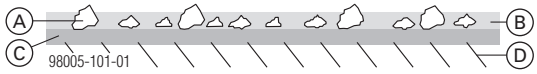


Sheet surface

Concrete finish

Features (in addition to those of 3-SO 21mm and 27mm):

- Extra varnish sealant on one side
- Sealant sanded with corundum particles (anti-slip)



A	Corundum
B	Varnish sealant
C	Melamine resin
D	Spruce face layer

- The corundum particles give the sheets a matt surface
- Very low absorbency
- Normal pore formation
- Light-coloured concrete

For available sizes see Article list.

Doka formwork sheet 3-SO

Sheet surface

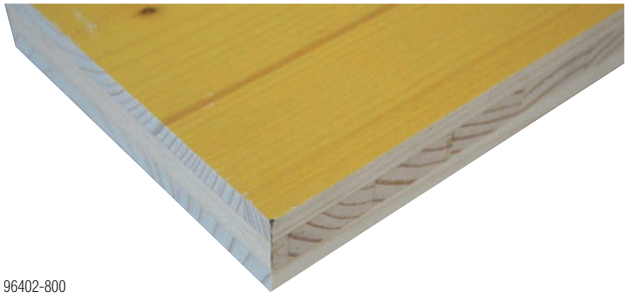
Concrete finish

Features:

- Crosswise glue-bonded three-ply spruce sheet
- Thinner face layers, so less prone to cracking
- Glue-coated surface on both sides
- Boilproof, alkali-proof, water and weathering-resistant glue-bonding
- Slightly board-like surface structure (depending on timber moisture content)
- Used on wall and floor-slab formwork
- Consistently high timber quality
- Smooth concrete finish
- Smooth concrete surface, of uniform appearance
- Concrete surface lightish in colour
- Knots, board joints, cracks, etc. show dark.
- Slightly absorbent surface (making for low pore formation)

For available sizes see Article list.

Doka formwork sheet 3S basic



96402-800

Sheet surface

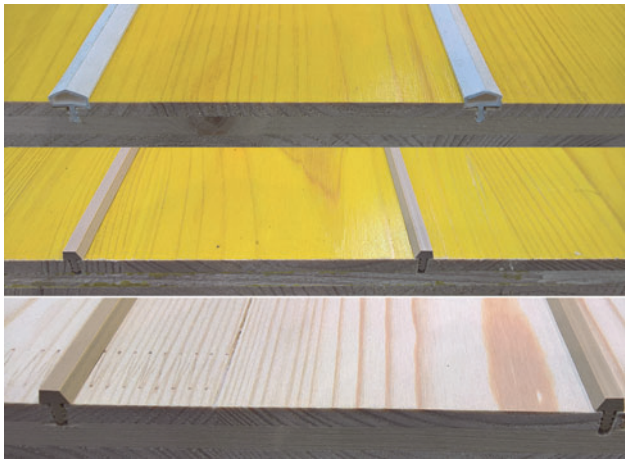
Concrete finish

Features:

- Crosswise glue-bonded three-ply spruce sheet
- Thinner face layers, so less prone to cracking
- Glue-coated surface on both sides
- Boilproof, alkali-proof, water and weathering-resistant glue-bonding
- Slightly board-like surface structure (depending on timber moisture content)
- Used on wall and floor-slab formwork
- Consistently good timber quality
- Smooth concrete finish
- Smooth concrete surface, of uniform appearance
- Concrete surface lightish in colour
- Knots, board joints, cracks, etc. show dark.
- Slightly absorbent surface (making for low pore formation)

For available sizes see Article list.

Doka formwork sheet 3-SO (special production)



Sheet surface (choice of variants)

Concrete finish

Features (in addition to those of 3-SO 21mm and 27mm):

- Wide choice of profiles
- Variable profile spacing
- Untreated surface also available (wood structure visible)
- Board-like character created by recessed grooves (results in ribbed finish)
- Slightly absorbent
- Light-coloured concrete

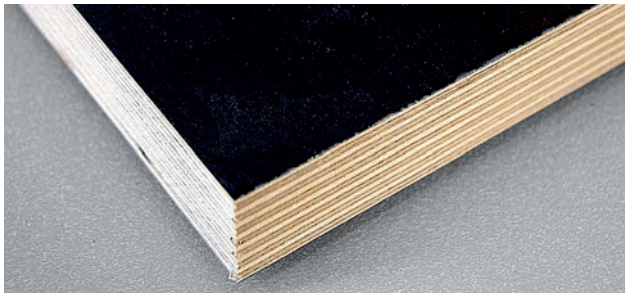
NOTICE

Allow longer hardening times before striking!

Risk of "ribs" breaking off when the formwork is struck, particularly when they run horizontally!

For available sizes see Article list.

Dokaplex formwork sheet and Doka multi-ply formwork sheet



Sheet surface

Concrete finish

Features:

- Crosswise glue-bonded birch plywood
- Identically phenolic resin-coated on both sides
- Used in wall and floor-slab formwork
- Sheet for smooth fair-faced concrete surfaces
- Cut edge is sealed
- Slightly absorbent
- Structureless (smooth) surface
- Normal pore formation
- Light-coloured concrete

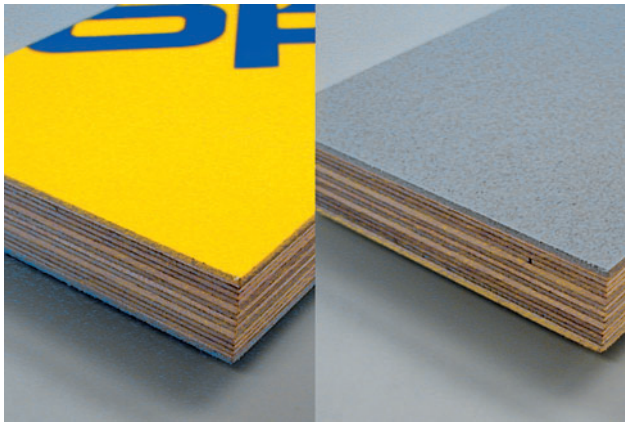
- High numbers of repeat uses are possible, especially when the sheet is screwed from behind

Note:

- Sheets 18 mm and thicker can be screwed from behind
- Sheets 4 mm and 9 mm thick are fastened with nails, staples or screws on the side facing the concrete
- Sheets 4 mm thick need more nailing to prevent rippling
- When plywood sheets are used for concreting, variations in timber moisture content can cause slight rippling of the face layer, particularly when plywood sheets are re-used.
- Rippling can also occur if the surface coating is damaged. For this reason, handle the sheet with great care.
  - Avoid hammer-blows, scratches etc.
  - When these sheets are used in floor-slab formwork, use only vibrators fitted with rubber caps.

For available sizes see Article list.

Doka Xlife sheet



Sheet surface (left: back of sheet / right: side facing the concrete)

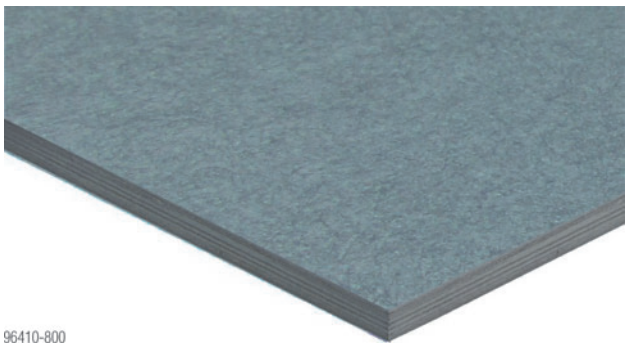
Concrete finish

Features:

- Crosswise glue-bonded birch plywood
- Force-orientated glue-bonding lines
- Side facing concrete and back have plastic skin
- Non-absorbent surface
- Sheet for smooth concrete surfaces (no rippling)
- High numbers of use cycles
- Screwed to the panel from behind
- Normal pore formation
- Light-coloured concrete
- Used in framed formwork panels, e.g. Framax Xlife, Framax Xlife plus, Frami Xlife (screwed to frame from behind).
- Used in Dokadek 20 and Dokadek 30 panels (riveted to frame from the side facing the concrete).
- Only conditionally usable as loose sheet (force-oriented glue-bonding lines, sizes).

For available sizes see Article list.

Doka Xface sheet



Surface of sheet (side facing concrete)

Concrete finish

Features:

- High-quality birch plywood sheet with fibre-reinforced synthetic-resin coating on the concrete-facing side, phenolic-resin film on the back of the sheet
- Large sheets with an oversize allowance for cutting
- No release agents needed during initial use cycles.
- The sheets' excellent release properties make them easy to clean (see video link below)
- Highly UV-resistant coating, so no discolouration of the concrete
- Normal pore formation
- Light-coloured concrete
- No rippling
- Coating is highly resistant, so concrete finish is uniform and smooth
- Nailing, cutting and drilling without splintering possible
- Non-absorbent surface

For available sizes see Article list.

Links to 'Cleaning the formwork sheeting' YouTube video:

German

Click here...

English

Click here...

Forming tubes

Concrete finish from standard version

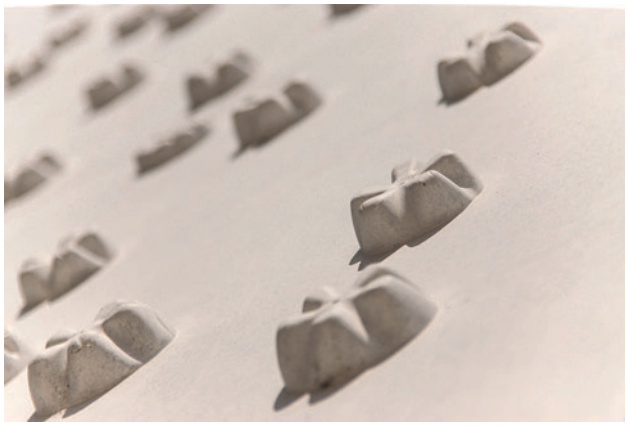
Features:

- Usually cardboard tubes with a coiled structure
- The inside surfaces in contact with the concrete are plastic-coated
- In principle for one-time use only (this applies to spiral-coil tube or smooth tube), but re-usable versions are becoming more common.
- Non-absorbent surface
- Smooth surface
- A few small, but also relatively large pores
- No release agent needed
- Light-coloured concrete

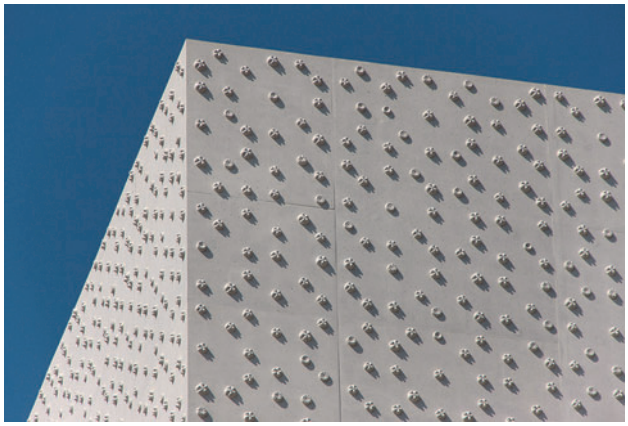
Note:

The coiled cardboard linings can leave slight marks on the concrete. However, there are also smooth tubes that do not leave the marks made by coiled cardboard linings.

Formliners



Formwork surface



Concrete finish

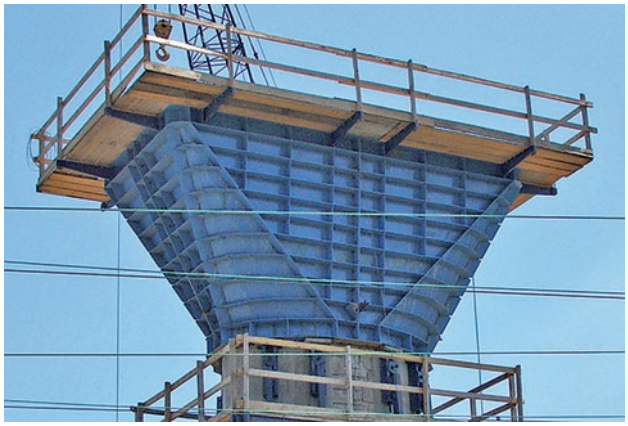
Features:

- Made of elastic plastic for multiple re-use cycles
- Coated polystyrene version for only small numbers of re-use cycles
- Non-absorbent surface
- Various different surface structures possible
- Normal pore formation
- Light-coloured concrete

NOTICE

- Note longer hardening and stripping times to prevent break-out of the concrete at edges and corners!
- When system formwork is used the formliner has to be glued to a carrier plate which in turn is screwed to the system formwork from behind (arrangements have to be made with the supplier of the formliner).

Steel and aluminium sheets



Formwork surface

Concrete finish

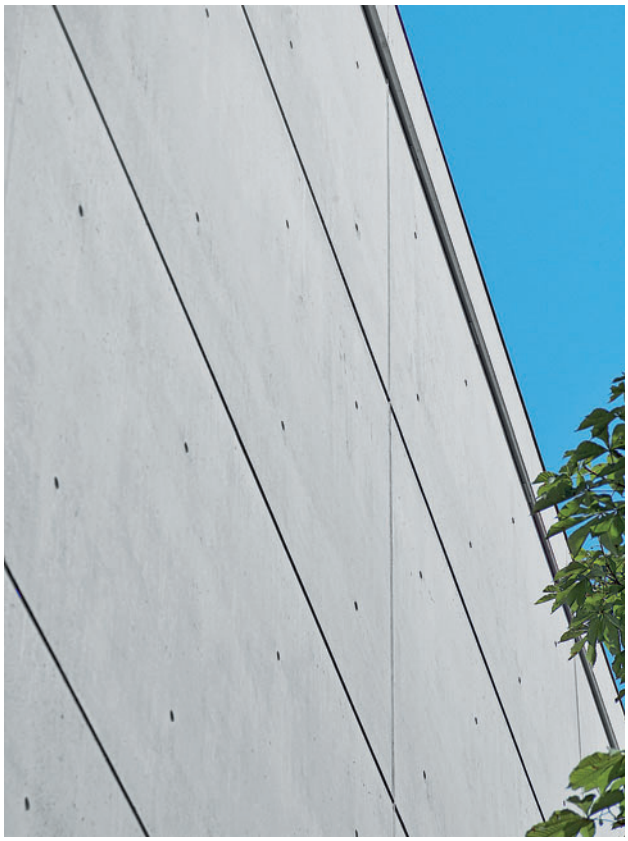
Features:

- Very high costs
- Mainly used in tunnel and bridge construction, due to the high number of re-use cycles
- Not common in building construction
- Non-absorbent surface
- Normal pore formation
  - Pore formation depends on installation position of the steel sheet. Slightly more pronounced pore formation when steel sheet is used in vertical position.
- Light-coloured concrete

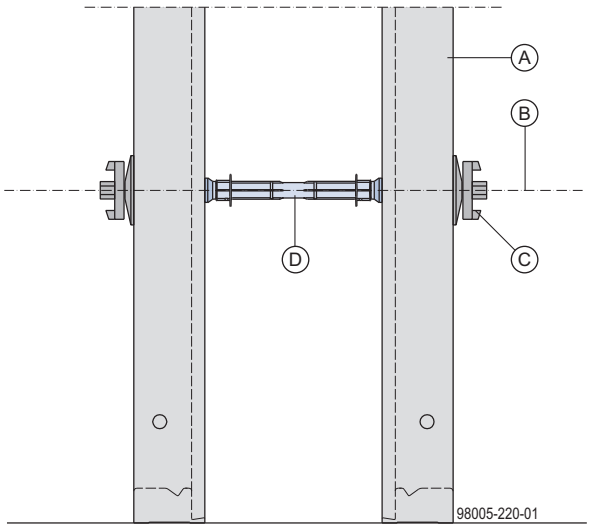
NOTICE

- Rust marks with untreated steel form-facing
- Difficult and time-consuming to attach box-outs, ledges, etc.
- Adaptations involve considerable extra outlay. No flexibility with regard to form-tie positioning
- Repairs (e.g. with filler compounds) can produce changes in colour in the finished concrete surface.

Form-tie points



Schematic drawing: Form-tie point



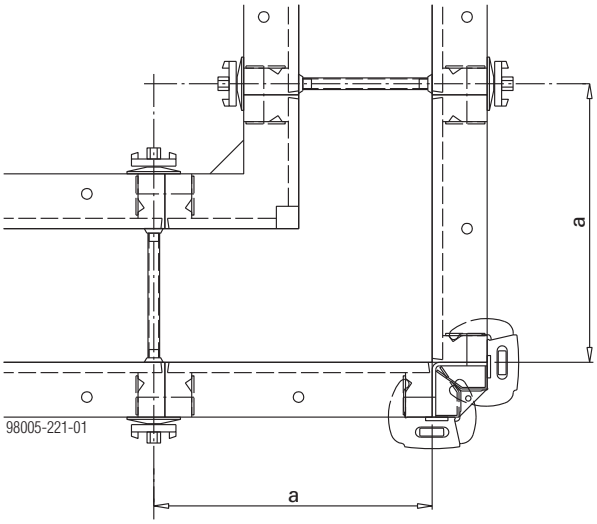
A	Formwork element
B	Tie rod 15.0
C	Super plate 15.0
D	Distance piece FFC 22mm

Tie rods sustain the fresh-concrete pressure of walls formed on both sides.

For high-specification architectural surfaces, the following points must be taken into consideration:

- The form-tie locations must be considered from both the architectural and the formwork-engineering viewpoints.
- When system formwork is used, the locations of the form-tie points are dictated by the panels or elements and therefore influence the design of the surface.
- With system formwork (e.g. Framax Xlife, Framax Xlife plus, Frami Xlife, Large-area formwork Top 50 and Wall formwork FF 20), the formwork panels/elements must be symmetrically opposite each another for the form-tie lead-throughs.
- There is only limited scope for varying the distances between the wall-ties and the connection joints or corner configurations.

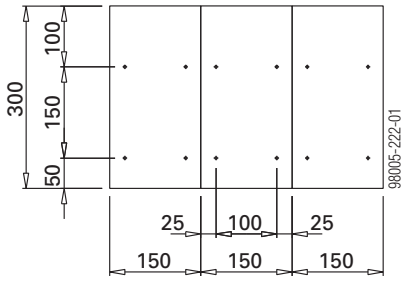
Schematic drawing: Framax Xlife corner configuration



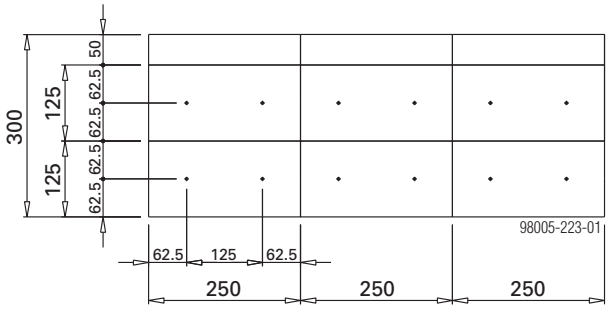
a ... 32.5 cm + wall thickness

- With project-specific formwork, there is more leeway for variation, but the constraints of technical viability still apply.

Example 1: Project-specific formwork



Example 2: Project-specific formwork



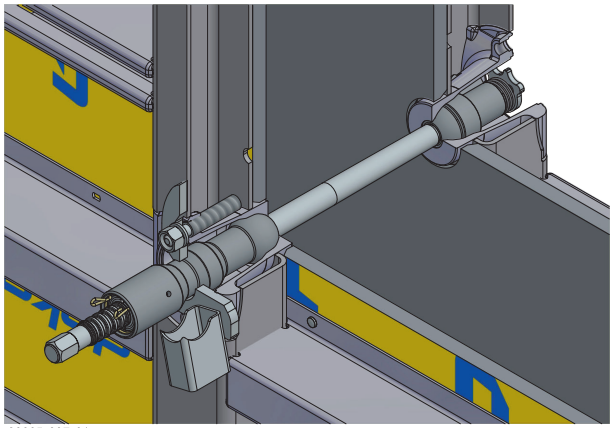
- Non-tied architectural surfaces are possible, but invariably involve considerable additional work and expense. The higher the wall, the greater the outlay involved (supporting construction frames on both sides, heavy steel girders).

Framax Xlife plus

Symmetrical tie-hole pattern in all panel widths, in both the horizontal and vertical directions.

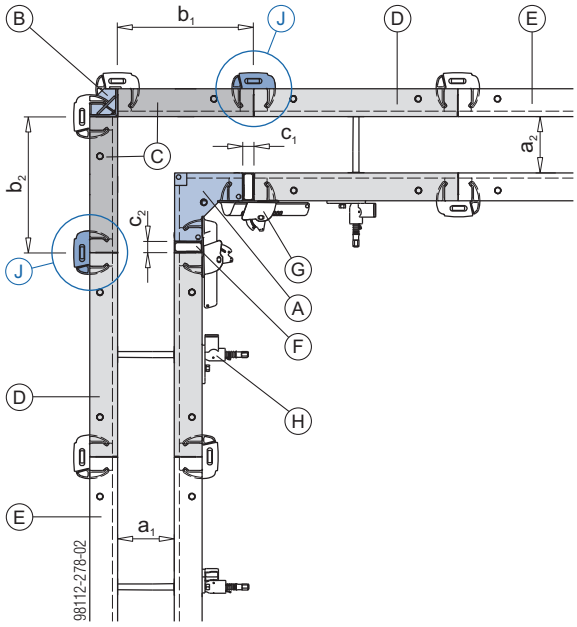
For details of the form-tie points see the section headed ‘Design details of formwork - Form-tie points’.

Schematic drawing: Form-tie point operable from one side (without Jacket tube Framax Xlife plus)



98005-237-01

Schematic drawing: Corner configuration with Framax Xlife plus



$a_{1,2}$ ... Wall thickness
$b_{1,2}$ ... Panel width
$c_{1,2}$ ... Closure width

A	Framax Xlife plus inside corner 30/30cm or Framax Xlife inside corner
B	Framax outside corner
C	Framax Xlife plus panel **0.45m** / **0.60m** / **0.75m**
D	Framax Xlife plus panel (**no panel with a width of 1.35 m!**)
E	Framax Xlife plus panel
F	Closure **0 - 15 cm** (Framax aluminium closure / Framax fitting timber)
G	Framax multi-function clamp
H	Tie rod system Framax Xlife plus 20.0
J	Inter-panel connection

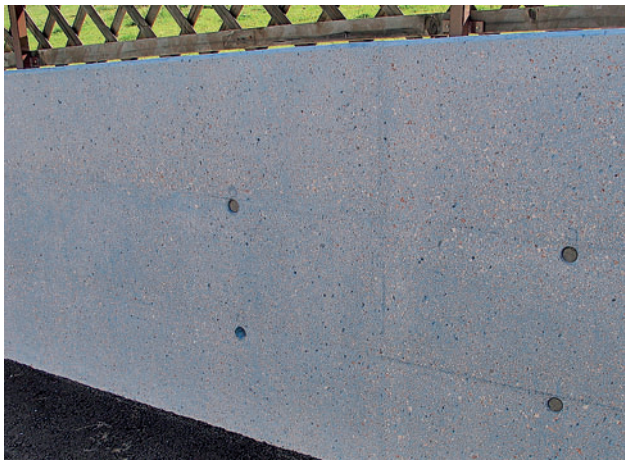
Subsequent reworking of the surfaces

As a rule, architect-specified exposed surfaces should be left as they are, in terms of form and finish, after completion.

In the majority of cases, attempts to touch up defects by application of commercially available repair mortars and grinding will fail. If remedial work is necessary, it is advisable to consult specialist companies with appropriate references.

Other possibilities for planned surface finishing are:

- Acidifying the surface
- Applying a special graffiti protection to make dirt and defacement easier to remove
- Washing out the cement paste to expose the grain structure to view
- Grinding the surface (terrazzo effect)
- Bush-hammering the surface
- Hydrophobisation
- Sandblasting



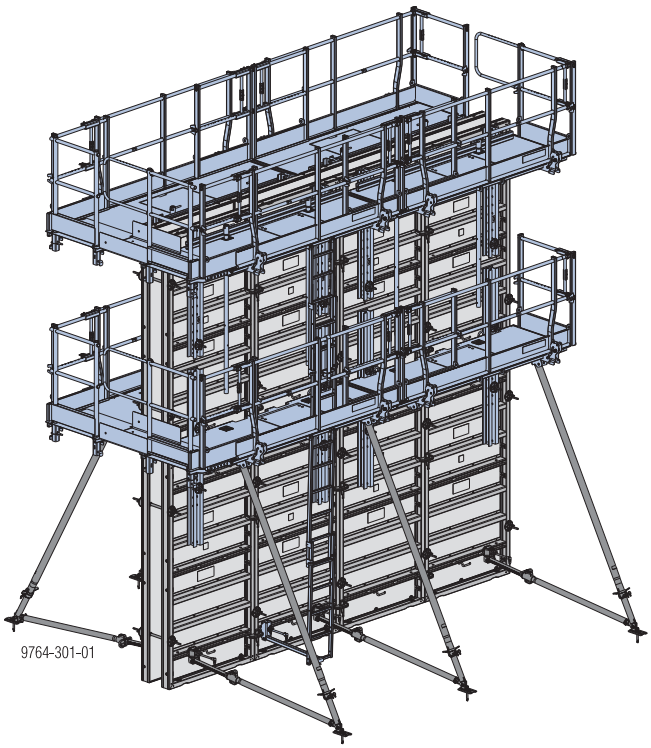
Blue concrete (bush-hammered)

Treatment with concrete retardant followed by washing out of the treated areas

Formwork systems and their attributes

Framed formwork

Framed formwork Framax Xlife and Alu-Framax Xlife



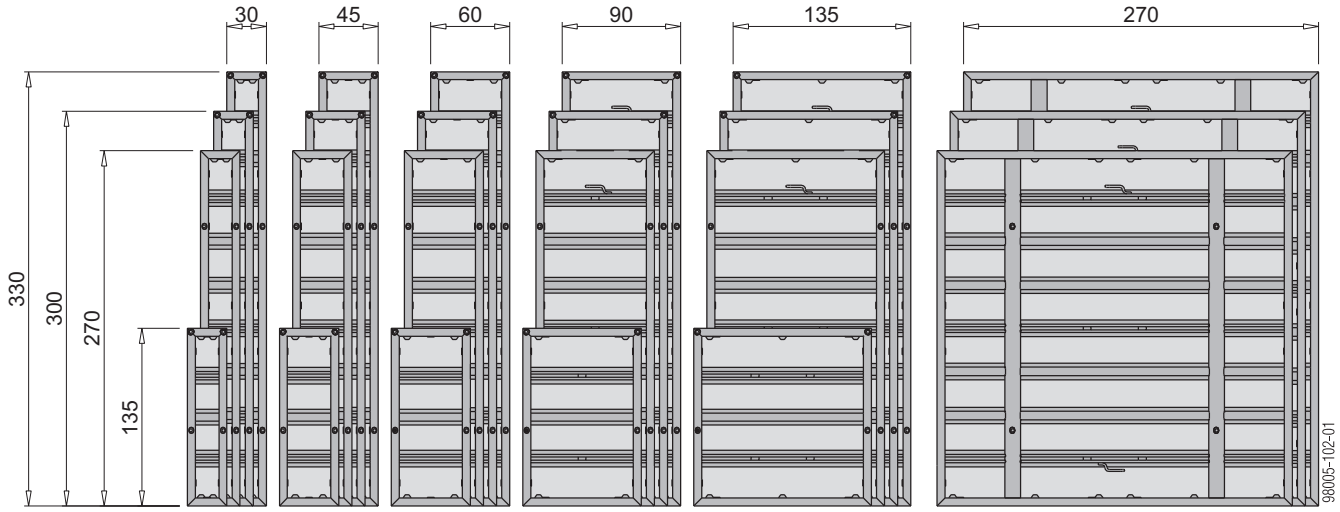
Complete systems with high-performance safety and workplace accessories with which large-area forming in particular can be tackled very swiftly and efficiently.

Features:

- Pre-fabricated framed formwork panels
- Defined panel widths
- Pre-defined formwork sheeting
- Frame imprints on the concrete surface
- Formwork sheeting screwed from behind (no marks left in the concrete by fixing screws or nails)
- Orderly horizontal and vertical joint pattern
- Orderly, fixed tie-hole pattern
- Flexible, because panels can be combined (15 cm increment-grid)
- Panels can be combined upright or on their side.

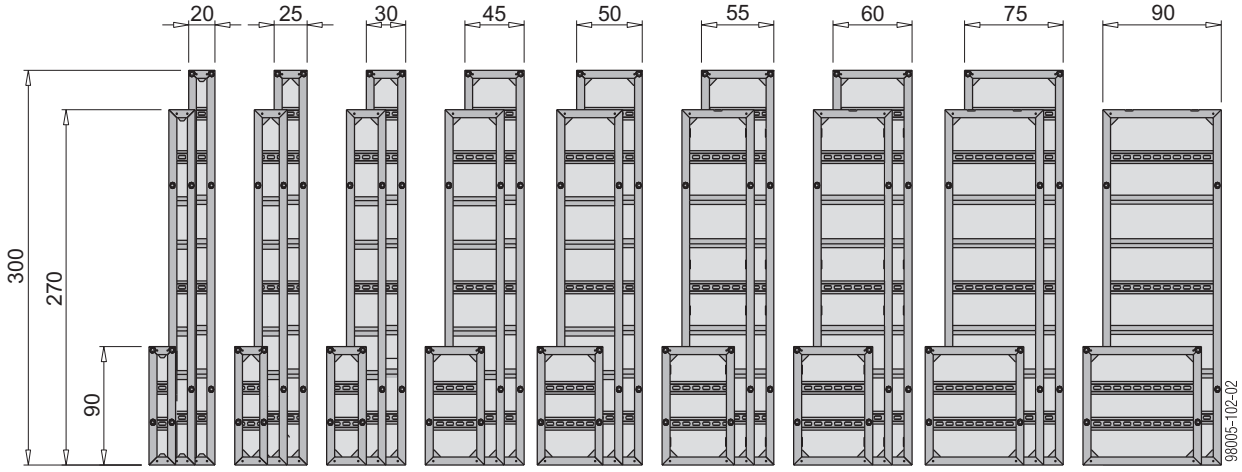
Frame imprint (width = 18 mm, depth = 1.5 mm)

Framax Xlife panel size-grid



Note:
Other panel widths on request.

Alu-Framax Xlife panel size-grid



Links to the latest versions of the User Information booklets:

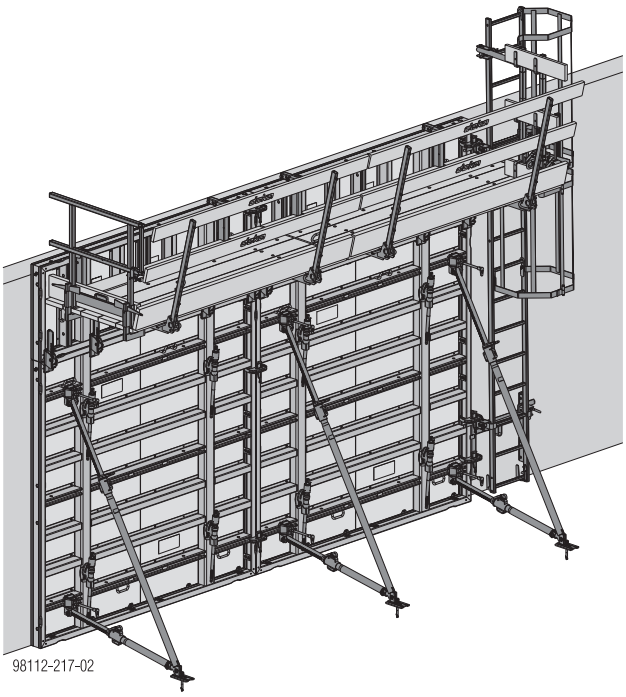
Framax Xlife

Click here...

Alu-Framax Xlife

Click here...

Framed formwork Framax Xlife plus



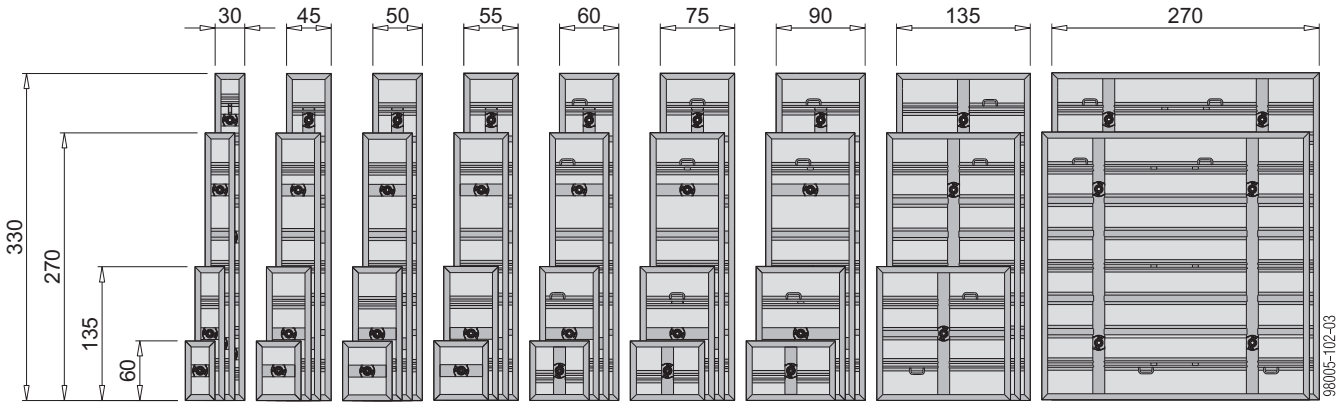
Unlike Framax Xlife, Framed formwork Framax Xlife plus can be operated from one side. No jacket tube is needed, because the form tie is conical. The tie-hole pattern, moreover, is symmetrical.

The heights and widths of the Framax Xlife plus panels result in a logical, advantageous increment-grid that makes this formwork highly flexible and economical.

Features:

- Easy planning and forming
- 15 cm increment-grid
- Very few closures needed
- Clear joint pattern
- Form ties are in a symmetrical pattern
- Form ties in the panel, not in the inter-panel joint.

Framax Xlife plus panel size-grid

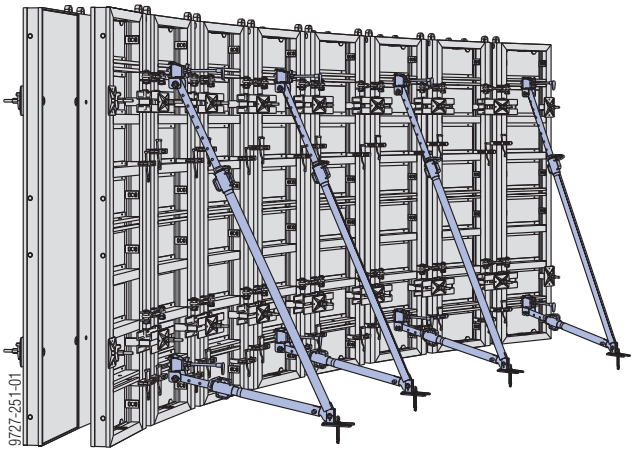


Note:
Other panel widths on request.

Link to the latest version of the User Information booklet:

Click here...

Circular formwork Framax Xlife



With the Framax circular forming plates and the panels of the Framax Xlife framed formwork system, "circular" (i.e. polygonal) structures can be formed. All the standard accessory parts of the Framax Xlife program can be used.

Features:

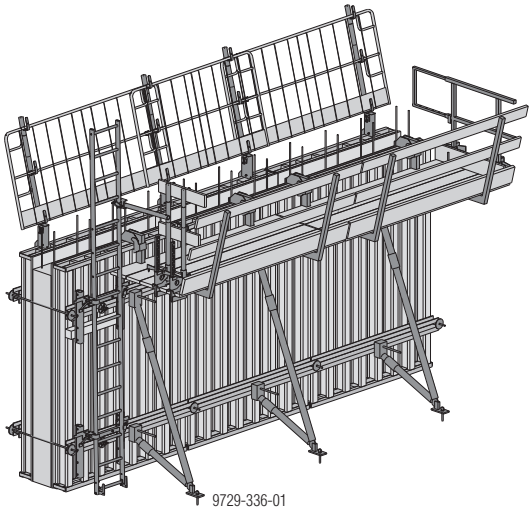
- Minimum inside radius: 1.80 m
- Frame imprint and imprint of the circular forming plate visible
- Predefined form tying on the circular forming plate
- Curves formed as polygons
- Same height grid as Framax Xlife

Link to the latest version of the User Information booklet:

Click here...

Timber-beam formwork

Wall formwork FF20

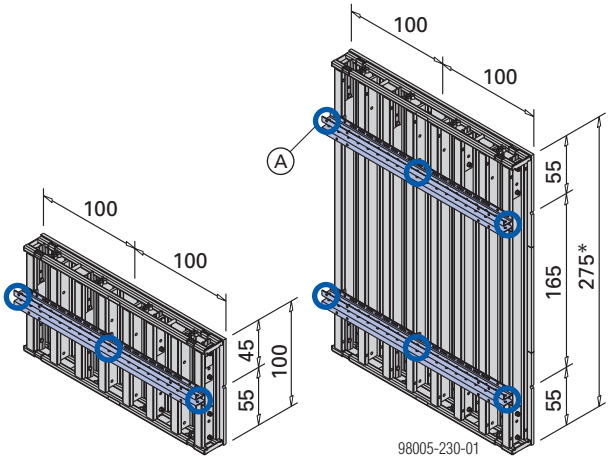


Wall formwork FF20 has ready-to-use panels for the most common pouring heights. It combines the advantages of a timber-beam formwork with the grid-related advantages of a framed formwork system.

Features:

- No frame imprints
- Pre-assembled formwork panels
- Pre-defined panel widths
- Tie-hole pattern dictated by the system; to a limited extent horizontally variable
- Girder grids possible for variable formwork sheeting

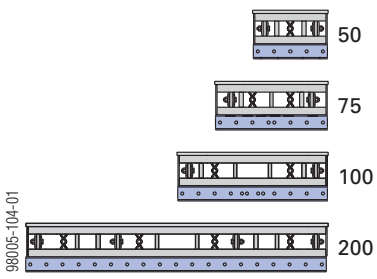
Panel heights:



* ... 3.75 m and 6.50 m in Germany only

A Form-tie point

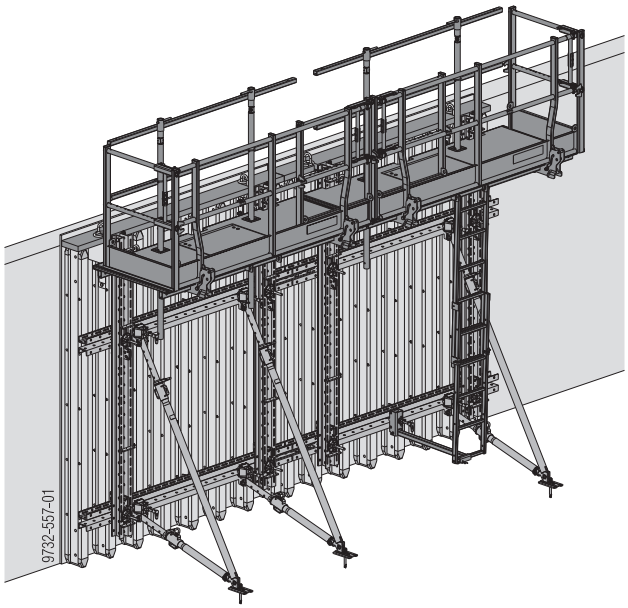
Panel widths:

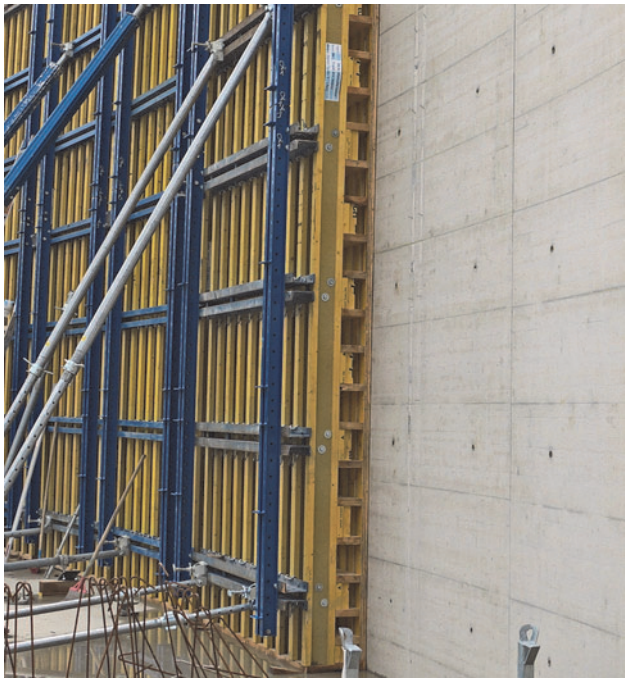


Link to the latest version of the User Information booklet:

Click here...

Large-area formwork Top 50





Large-area formwork Top 50 can be tailored to many, very diverse tasks. Panel shape and size can be optimally adapted to the structure.

Doka plans the most economical solution for you. Having your formwork pre-assembled by the Doka Pre-assembly Service saves time and space on site.

Features:

- Timber-beam formwork pre-assembled on project-specific basis
- Choice of formwork sheeting (e.g. for smooth fair-faced concrete, wood texture, etc.)
- No frame imprints
- For every shape of structure
- Adaptable to different fresh-concrete pressures
- Free choice of form-tie and joint patterns within statically permitted limits
- Profiled timber formers (special shapes) are CNC-milled for high accuracy

By using extra items from the Doka standard range, wider tie spacing can be achieved than with conventional formwork systems.

Note:

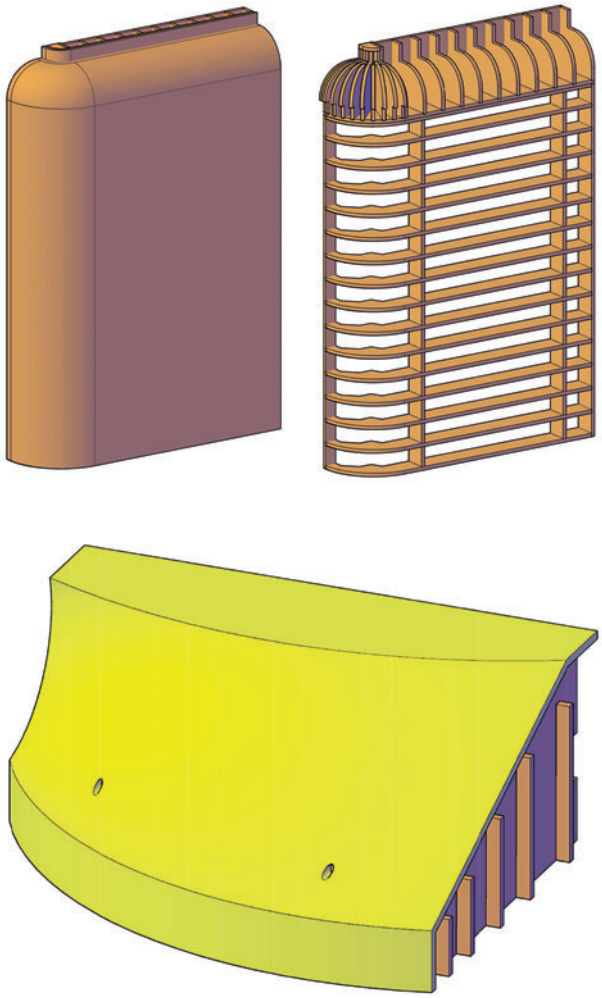
- Allow for planning and production lead-times!
- When elements are pre-assembled by Doka, allow for the permissible transport dimensions.

Link to the latest version of the User Information booklet:

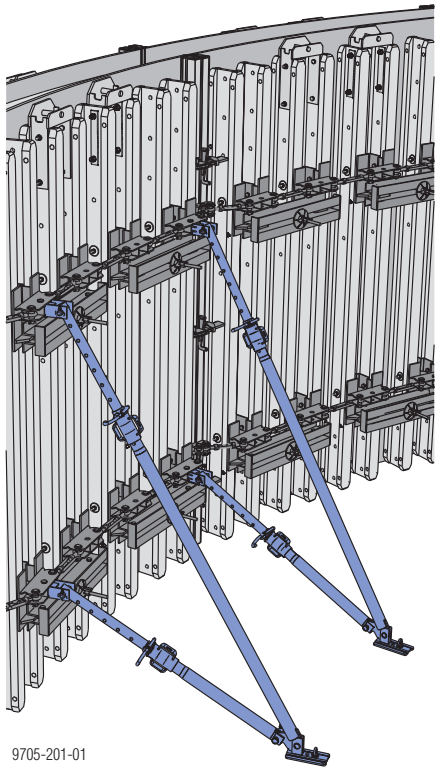
Click here...

Examples of different surface designs

Examples for special shapes



Circular formwork H20



Circular formwork H20 uses special spindles to bend the formwork sheeting into an arc.

This system of adjustment permits stepless changes of radius. Circular formwork H20 is designed for a standard minimum radius of 3.50 m; in special cases, a radius of 2.50 m is possible.

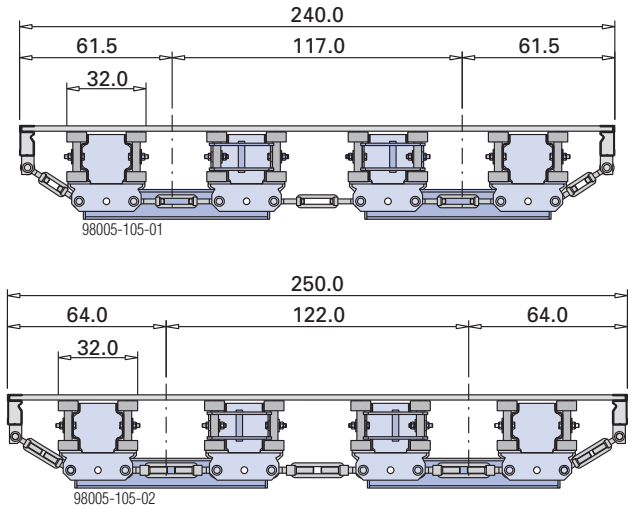
The circular formwork elements are supplied to the site pre-assembled, ready to be curved to the correct radius on site.

Special connecting profiles enable combinations with Framax Xlife plus, Framax Xlife, Alu-Framax Xlife and Column formwork RS.

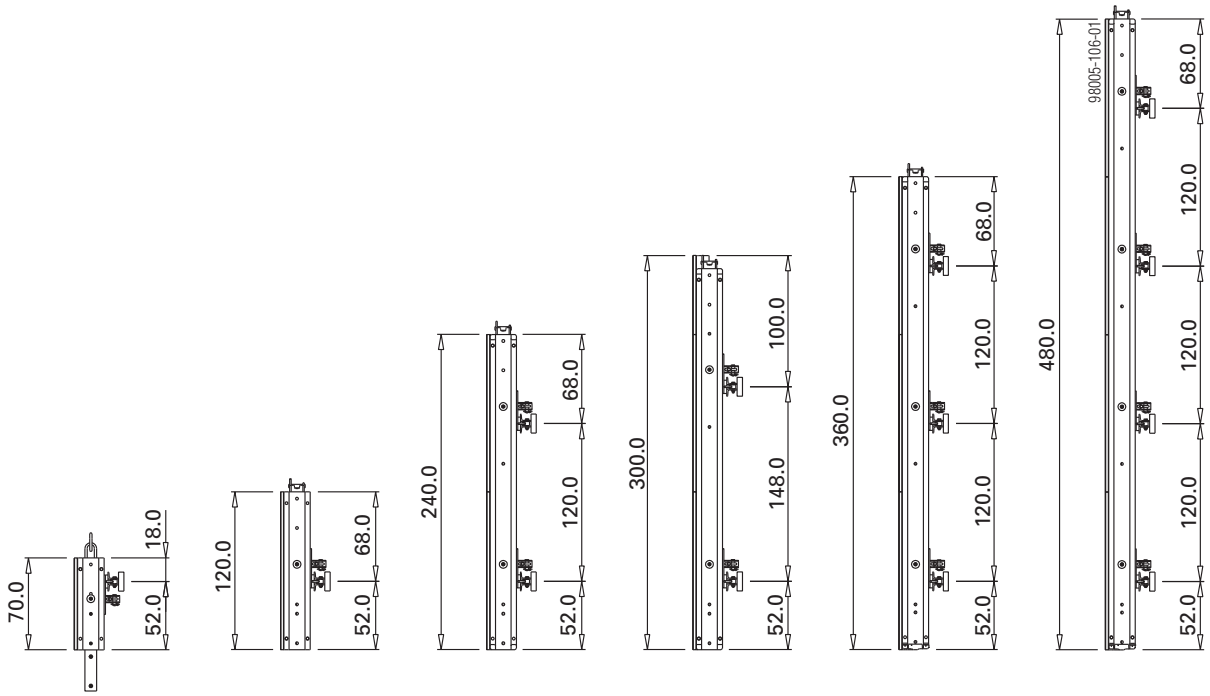
Features:

- Pre-assembled elements
- Pre-installed formwork sheeting (Dokaplex)
- Radii can be custom-adjusted
- Frame imprint on the concrete surface
- Orderly, fixed tie-hole pattern
- Formwork sheeting screwed from front

Panel widths:



Panel heights:



Screw-fixing of formwork sheeting at the edges (butt-jointing area) of the panels

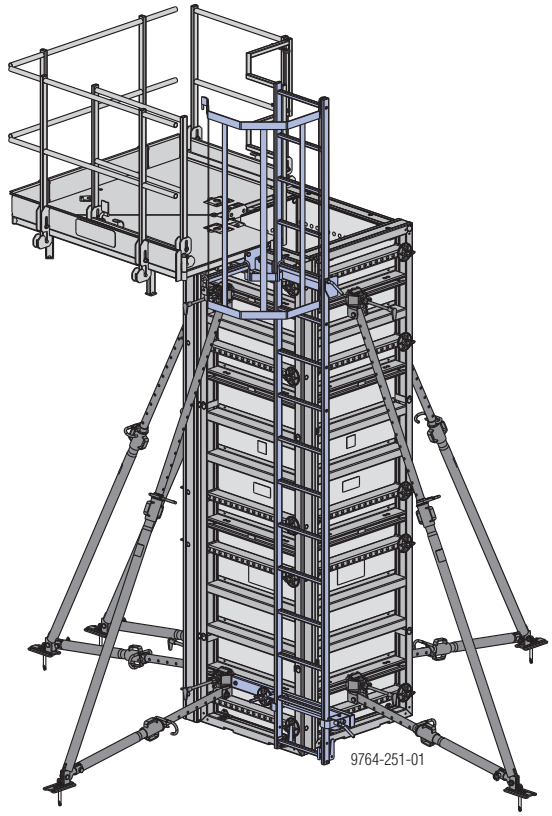
Overall view

Link to the latest version of the User Information booklet:

Click here...

Column formwork

Column formwork Framax Xlife / Alu-Framax Xlife



Column formwork Framax Xlife and Column formwork Alu-Framax Xlife both use universal panels from their respective wall formwork systems, with widths of 1.20 m or 0.90 m (Framax Xlife) and 0.75 m (Alu-Framax Xlife).

Features:

- Pre-fabricated framed formwork panels, formwork sheeting enclosed in frame
- Pre-installed formwork sheeting (Xlife sheet, or Dokaplex sheet on request)
- Concrete bears a slight imprint of the plugs inserted in the holes not used for corner connectors
- Slight imprint of the 5 cm hole-grid visible on the concrete surface
- Can be used for rectangular or square column cross-sections up to 105 x 105 cm (Framax Xlife) or 60 x 60 cm (Alu-Framax Xlife), in the 5 cm increment-grid
- PVC triangular ledge possible in the system

Links to the latest versions of the User Information booklets:

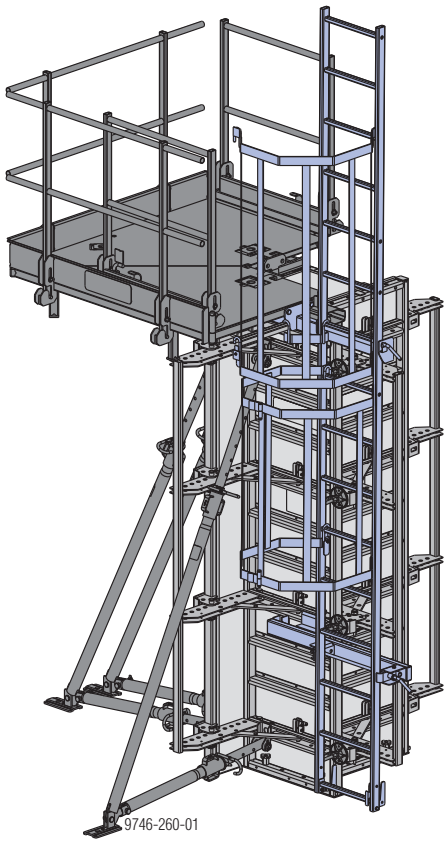
Framax Xlife

Click here...

Alu-Framax Xlife

Click here...

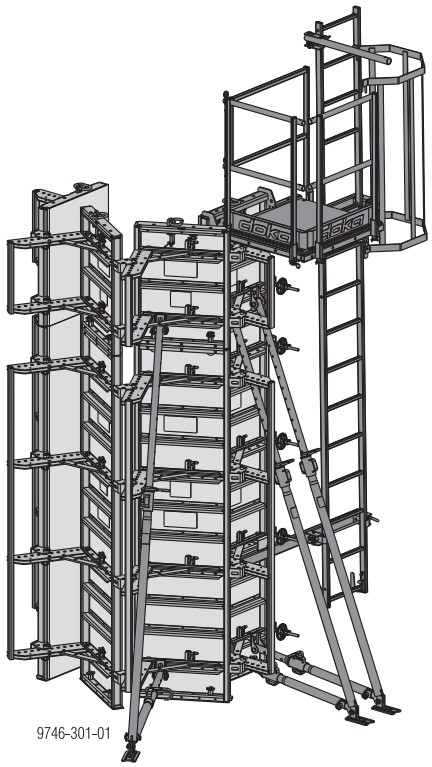
Column formwork KS Xlife



Column formwork KS Xlife is a site-ready column formwork system. The formwork is easy to open and close, resulting in very short striking and set-up times.

Features:

- Pre-fabricated framed formwork panels, formwork sheeting enclosed in frame
- Pre-installed formwork sheeting (Xlife sheet)
- Can be used for rectangular or square column cross-sections up to 60 x 60 cm, in the 5 cm increment-grid
- PVC triangular ledge possible in the system
- Smooth surface without imprints on the concrete surface

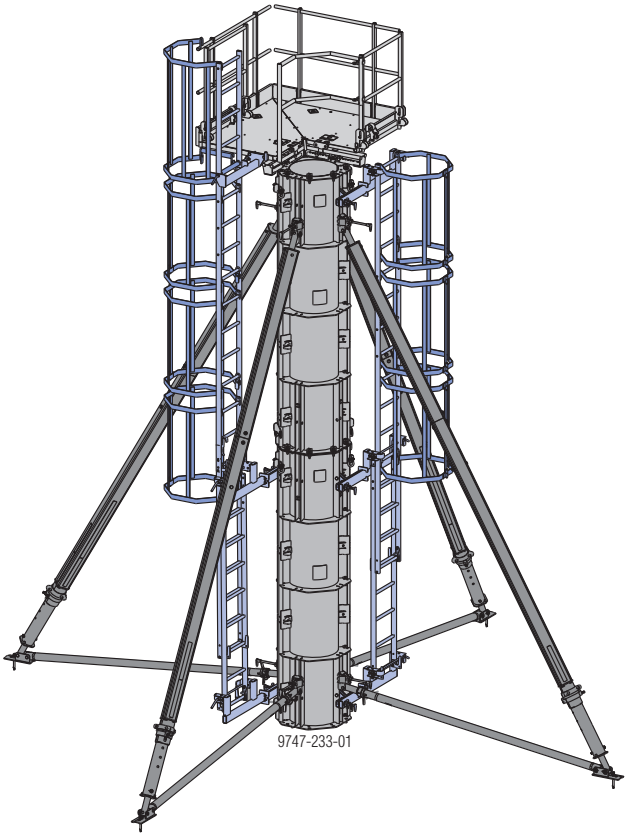


Column formwork KS Xlife opened

Link to the latest version of the User Information booklet:

Click here...

Column formwork RS



Column formwork RS is used for concrete surfaces to meet elevated requirements.

Features:

- Pre-fabricated steel panels with steel formwork sheeting
- Precision inter-panel joints achieved by the centring function
- For diameters from 30 to 60 cm
- Butt joints leave a slight imprint on the concrete

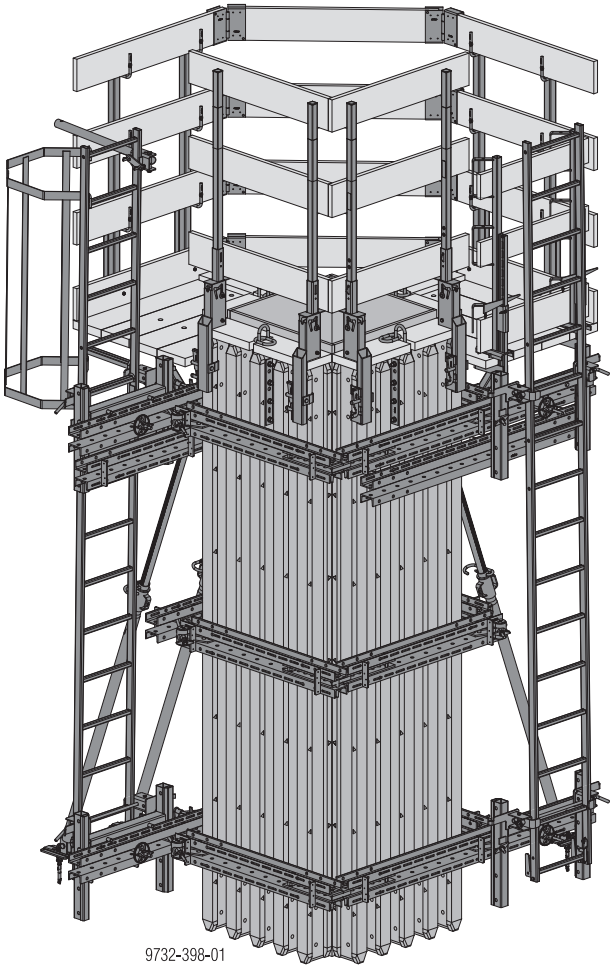
Note:

Protect the surface to prevent rust

Link to the latest version of the User Information booklet:

Click here...

Column formwork Top 50



Column formwork Top 50 is made-to-measure formwork for widely varying tasks. Panel shape and size can be optimally adapted to the structure.

Features:

- Project-specific timber-beam formwork
- Free choice of formwork sheeting
- For structures of any shape (no-ties forming possible up to a cross-section of 120x120 cm)
- Adaptable to different fresh-concrete pressures

Note:

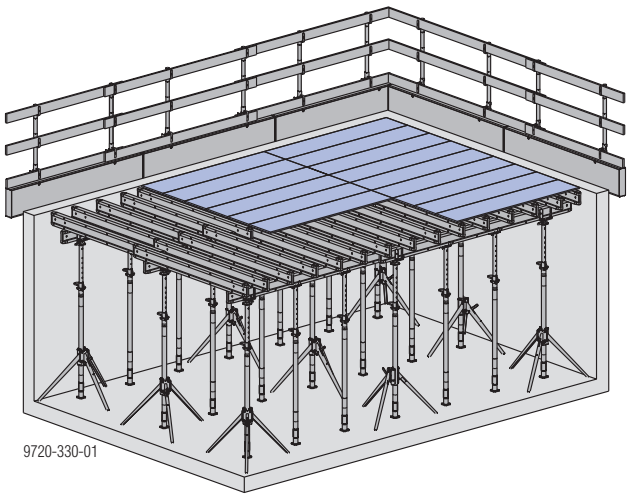
In sharp-edged configurations it is important to make sure the corner joints seal tightly.

Link to the latest version of the User Information booklet:

Click here...

Floor-slab formwork

Dokaflex



The fast, versatile floor-slab formwork for any floor plan, for downstand beams, stepped floors and construction using filigree slabs. Free choice of formwork sheeting to satisfy any architectural preferences regarding the concrete finish.

Features:

- Propping heights up to approx. 5 m
- Infill zones dealt with in the system by telescoping the beams
- Easy adaptation to walls and columns
- Free choice of formwork sheeting

Note:

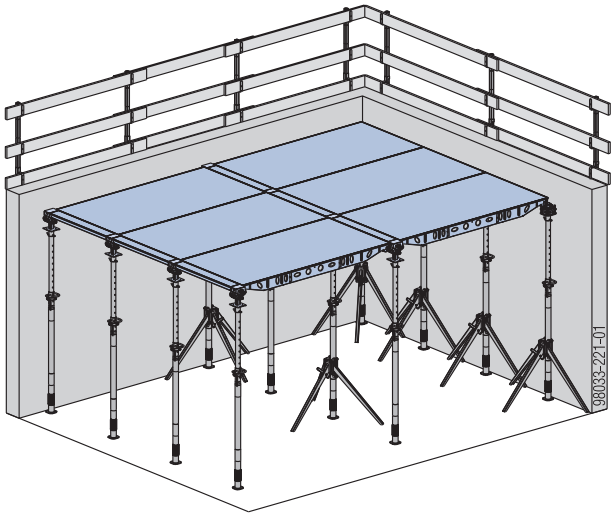
- Formwork sheets that have experienced different degrees of usage can cause colour differences in the concrete due to differences in absorbency from sheet to sheet.
- If a special formwork-sheeting arrangement is specified, this can influence the propping system.

- Where two separate layers of formwork sheets are used (one structural the other architectural), the formwork-sheeting grid can be adapted to architectural preferences.
- Use vibrators fitted with rubber caps.
- Protect formwork sheets from dirt when reinforcement work is carried out and during subsequent finishing operations. Dirt can usually be removed by using drywall grinders with synthetic non-woven coverings.

Link to the latest version of the User Information booklet:

Click here...

Panel floor formwork Dokadek 30



Dokadek 30 is a beam-less, lightweight steel handset formwork system with coated frames and wood/plastic composite sheeting. Dokadek 30 combines the advantages of a panel floor formwork system with those of Dokaflex floor-slab formwork, namely speed in the typical zone with the 3 m^2 panels and Dokaflex rapidity and flexibility in the infill zones.

Features:

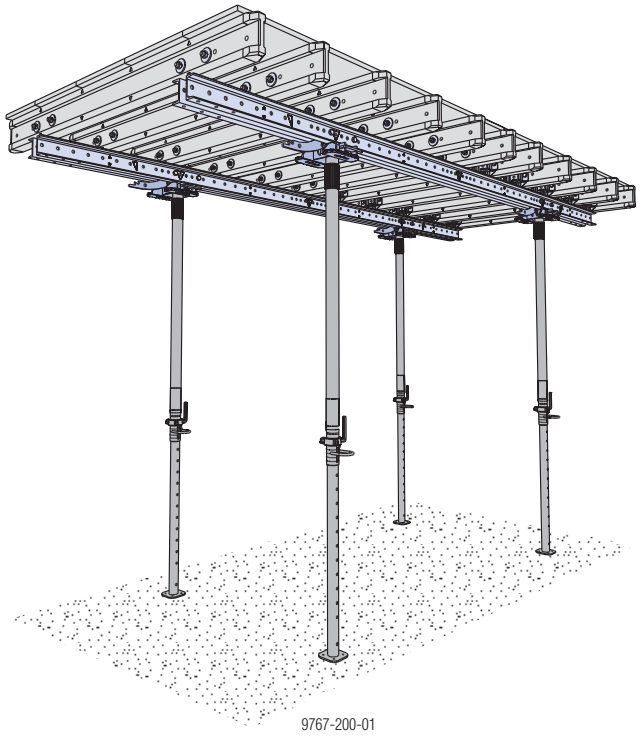
- Much like wall framed formwork, framed panels mark the surface of the concrete (inter-panel joints).
- Frame-to-frame butt joints might require sealing (in cool weather).
- The panel size-grid is determined primarily by room geometry and can be changed only to a limited extent.

- Use vibrators fitted with rubber caps.
- Dirt can usually be removed by using dry-wall grinders with synthetic non-woven coverings.

Link to the latest version of the User Information booklet:

Click here...

Dokamatic tables



9767-200-01

For rapid set-up to form large slabs – easy to adapt to widely varying requirements on the site.

Features:

- 4 standard sizes with grid logic:
  - 2.50 x 4.00 m
  - 2.50 x 5.00 m
  - 2.00 x 4.00 m
  - 2.00 x 5.00 m
  - Custom sizes possible
- Sheeted with 3-S formwork sheets, 21 mm or 27 mm. Custom sheeting in the different regions possible.
- The Dokamatic table grille is available for a free choice of formwork sheeting.
- Pre-defined table grid

At closures and infills, use the same sheeting or sheeting in the same condition of usage.

Link to the latest version of the User Information booklet:

Click here...

Summary

Wall formwork

Requirement	Framed formwork Framax Xlife, Alu-Framax Xlife, Framax Xlife plus	(System) Wall formwork FF20	(Project-specific) Large area formwork Top 50	Circular formwork H20
Frame imprints	Yes	No	No	Yes
Joint pattern	In the system grid	In the system grid	Selectable [1]	In the system grid
Tie-hole pattern	In the system grid (Framax Xlife and Alu-Framax Xlife) Symmetrical pattern (Framax Xlife plus)	In the system grid (conditionally selectable)	Selectable [2]	In the system grid
Formwork sheeting	Xlife sheet (plastic-coated)	Three-ply sheet or selectable, as applicable	Selectable	Dokaplex sheet (film-coated)
Sheet fastening	Screwed from behind	Nailed from front	Selectable	Screwed from front
Permissible fresh-concrete pressure	80 kN/m²	50 kN/m²	Adaptable	60 kN/m²
Geometry	Fixed widths and heights	Fixed widths and heights	Adaptable	Fixed widths and heights

[1] Note formwork sheeting and available parts.

[2] In accordance with statical requirements

Column formwork (non-tied)

Requirement	Framed formwork Framax Xlife, Alu-Framax Xlife	Column formwork KS Xlife	Column formwork RS	(Project-specific) Large area formwork Top 50
Frame imprints	Yes	No	Yes (inter-panel joint)	No
Imprints from hole-grid in formwork sheeting	Yes	No	No	No
Formwork sheeting	Xlife sheet (plastic-coated)	Xlife sheet (plastic-coated)	Steel	Selectable
Sheet fastening	Screwed from behind	Screwed from behind	Welded from behind	Selectable
Permissible fresh-concrete pressure	90 kN/m²	90 kN/m²	150 kN/m²	Adaptable
Dimensions	25 x 25 cm up to 105 x 105 cm	20 x 20 cm up to 60 x 60 cm	30 to 60 cm diameter	adaptable (max. 120 x 120 cm)

Floor-slab formwork

Requirement	Dokaflex	Panel floor formwork Dokadek 30	Dokamatic table	Tableform skeleton
Formwork sheeting	Selectable	Xlife sheet (plastic-coated)	Three-ply sheet, varnished (in Germany, also available with plywood sheet)	Selectable
Sheet fastening	Hardly any	Riveted from above	Nailed from above	Selectable
Pre-defined formwork-sheet grid	No	Yes	Yes	Depends on tableform dimensions (selectable)
System components	Loose	Loose	Installed (except floor props)	Installed without formwork sheeting (except floor props)

Design details of formwork

Corners and edges

Corners and edges should not be sharp, as otherwise easily damaged both during formwork stripping operations and subsequently when the structure is in normal use and can be an injury hazard when the structure is in use (e.g. if someone falls).

Note:
Regional building codes may prohibit sharp edges anywhere up to 2 m above floor level in public buildings (such as schools).

Triangular ledges used in casting fair-faced concrete must be compatible with the formwork sheeting to prevent colour differences caused by differences in absorbency:

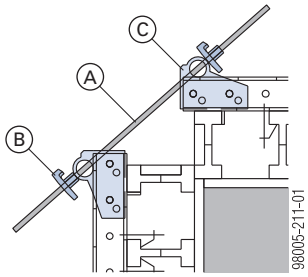
- Use PVC triangular ledges with Framed formwork Framax Xlife, Alu-Framax Xlife and Framax Xlife plus (non-absorbent triangular ledge with non-absorbent formwork sheeting)
- Use timber triangular ledges with formwork faced with with 3-ply sheets or boards (absorbent triangular ledge with absorbent formwork sheeting)

Match the triangular ledges to the usage condition of the formwork sheeting by treating them with concrete slurry

Corner cast with triangular ledge

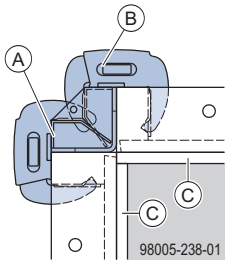
In principle, however, casting sharp-edged corners is feasible. To achieve clean sharp-edged corners, the formwork must be sealed by other means than triangular ledges (to prevent seepage of fine-grained mortar). Sharp-edged corners can best be achieved with Large-area formwork Top 50. Sharp-edged corners need to stay enclosed in the formwork for longer (until the concrete attains greater strength) to prevent damage when the formwork is stripped. See the section headed ‘Digital services’.

Corner cast without triangular ledge



Large-area formwork Top 50 for casting sharp-edged corners

A	Tie rod 15.0
B	Wing nut 15.0
C	Universal angle tie bracket



Framed formwork Framax Xlife

A	Framax outside corner
B	Framax quick acting clamp RU
C	Extra formwork sheeting

Infill zones

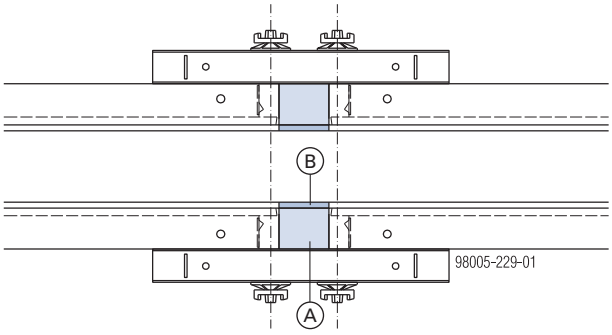
To prevent colour differences of the concrete in closure zones, with both wall and floor-slab formwork, observe the following points:

- Always use formwork sheets of the same type
- Always use formwork sheets that have had the same degree of usage
- Face the fitting timbers with strips of formwork sheeting

Example, framed formwork with non-absorbent formwork sheeting

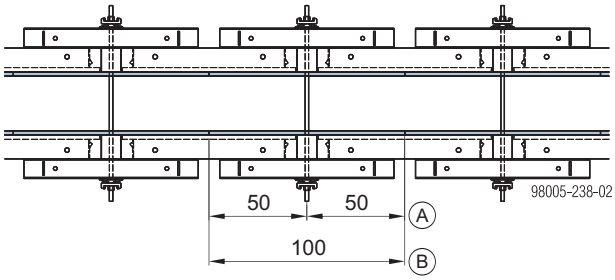
Different facing (framed formwork and fitting timber)

Same formwork sheeting (framed formwork and formwork sheet over fitting timber)

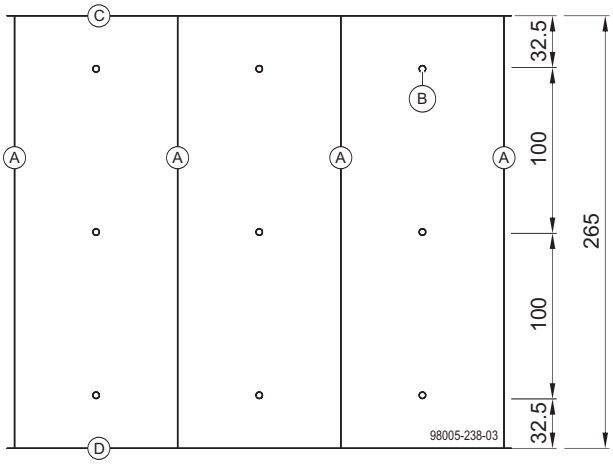


A Fitting timber
B Formwork sheeting

Framed formwork with extra fair-faced concrete formwork sheeting



A Form-tie position
B Formwork sheeting size (thickness of sheeting min. 18 mm and screwed from behind)



A Joint in the formwork sheeting
B Form-tie position
C Top of wall
D Bottom of wall

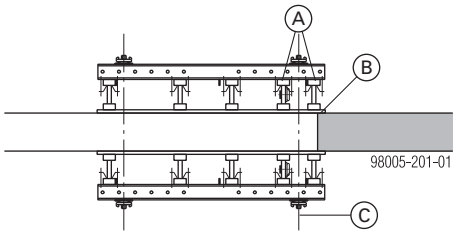
Location of end-ties

Correctly locating the end ties considerably reduces deformation of the wall formwork at construction joints. This mainly helps press joints in the formwork more tightly together, preventing seepage of fine-grained mortar.

Timber-beam formwork

Example 1

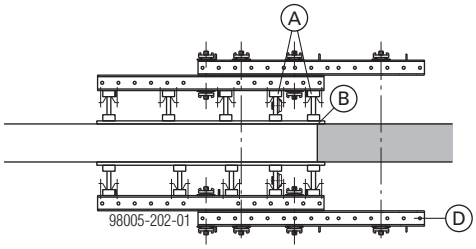
- Space the formwork beams closer together at the ends of the panels
- Locate the end ties as close as possible to the end of the pouring section.



Example 2

Form tie not possible at end of panel (e.g. due to the tie-hole pattern):

- Install extra multi-purpose waling.
- Additional anchoring in the previous pouring section.



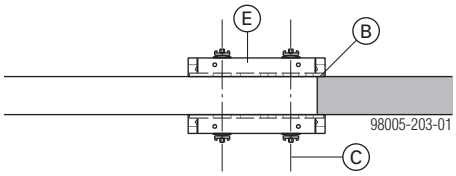
A	Doka beam
B	Sealing tape on both sides (see the section headed ‘Sealing vertical joints’)
C	Tie rod + super plates
D	Multi-purpose waling

Framed formwork

Example 1

Framax Xlife or Alu-Framax Xlife universal panels:

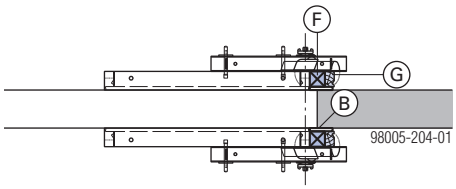
- Position end ties near the end of the pouring section by using the extra tie-holes in the Framax Xlife universal panel.



Example 2

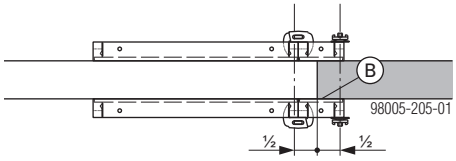
Fitting timbers:

- Position Fitting timber at pouring-section joint.
- Face the fitting timber with a strip of the same type of sheeting as the framed formwork.



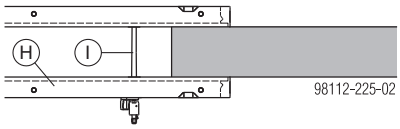
Example 3

Narrow panel at pouring-section joint



Example 4

Framax Xlife plus



B	Sealing tape on both sides (see the section headed ‘Sealing vertical joints’)
C	Tie rod + super plates
E	Framax Xlife universal panel
F	Fitting timber faced with formwork sheeting
G	Moulded timber
H	Framax Xlife plus panel
I	Tie rod system Framax Xlife plus 20.0

Form-tie points

When forming fair-faced concrete, the form-tie points are often used not only for sustaining the fresh-concrete pressure, but also as a design feature for the fair-faced concrete surface (tie-hole pattern).

This means that the form-tie points have to be prepared so as to give clean, neat results. Very often, however, "bleeding" and edge-flaking occur around the form-tie points, and also at the positioning points for working and protection platforms.

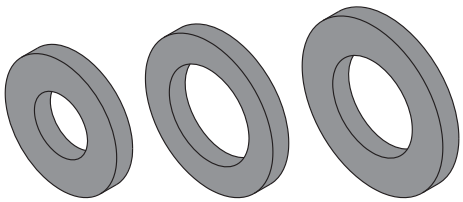
Edge-flaking around form-tie point

Doka offers the following products for preparing precision form-tie points and positioning points:

For more information also see the ‘Construction accessories for civil engineering and building construction’ booklet.

A fair-faced concrete samples kit will help you select the right plugs for closing form-tie points. Consult your Doka technician.

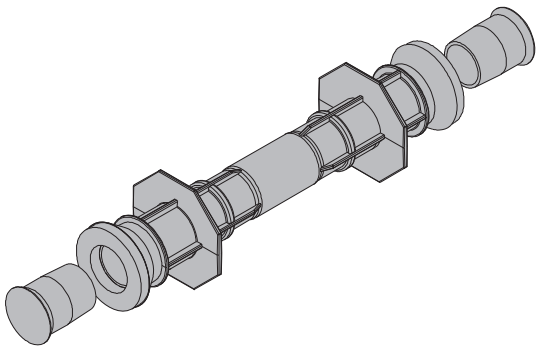
Sealing discs (loose)



The sealing disc prevents seepage of fine-grained mortar due to minor inaccuracies and where a form tie was installed at a slight angle. The loose sealing discs are simply glued into place on site.

- Sealing disc 20/43 20.0/26.5 (for Universal cone 22mm and Fair-faced concrete positioning cone 15.0 5cm) - for Tie rod system 15.0
- Sealing disc 30/50 (for Universal cone 26mm and Universal cone 32mm) - for Tie rod system 20.0
- Sealing disc 30/53 (for Fair-faced concrete positioning cone MF 15.0 5cm)

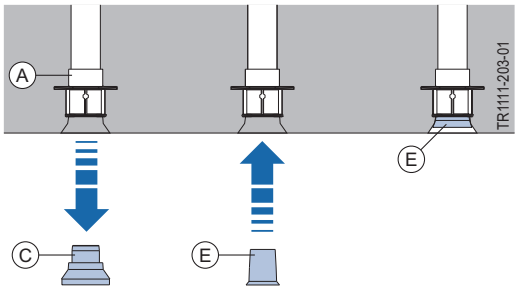
Distance piece FFC 22mm



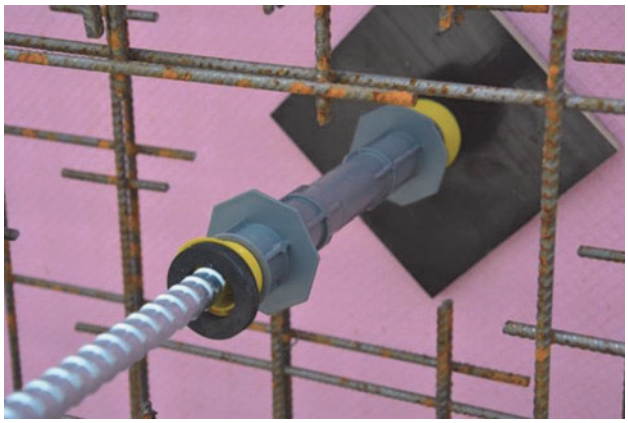
Lost form-tie jacket tube with low tolerances, incl. two Distance piece plugs 22mm for re-usable Tie rods 15.0mm.

Fixes the distance between the formwork panels.

Available for wall thicknesses 20 cm, 25 cm and 30 cm.



A	Distance piece FFC 22mm (or Tube end piece FFC 22mm and Plastic tube 22mm 2.50m)
C	Yellow attachable cone with integral Sealing disc 6mm
E	Distance-piece plug 22mm



Links to ‘Spacers’ YouTube video:

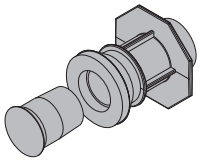
German

Click here...

English

Click here...

Tube end piece FFC 22mm



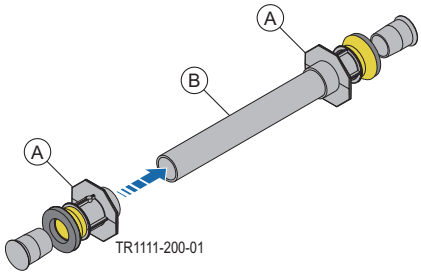
Tube end piece FFC 22mm includes a yellow Attachable cone with glued-on Sealing disc 6mm and a Distance-piece plug 22mm.

Tube end piece 22mm prevents fine-grained mortar seeping out due to minor inaccuracies or where a form tie was installed at a slight angle.

In combination with Distance piece plug 22mm or Plastic plug FFC 22mm, the form-tie point has the following properties:

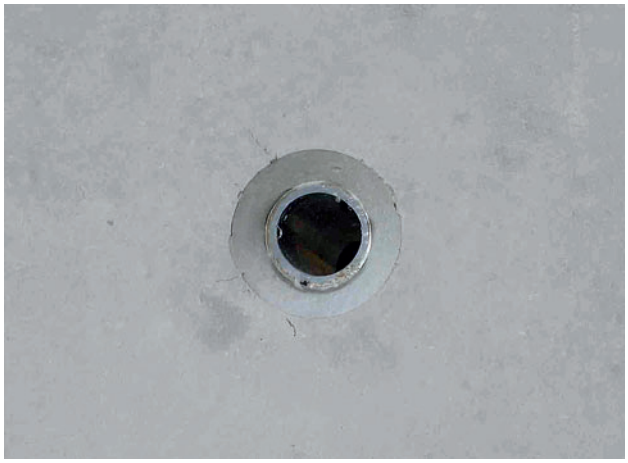
- Soundproof
- Fire-retardant
- Watertight

(Independent expert's reports on request!)



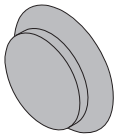
A Tube end piece FFC 22mm

B Plastic tube 22mm 2.50m
cut to length: Wall thickness minus 8 cm

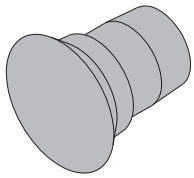


Sealed form-tie point with no bleeding and no edge-flaking

Concrete plug and Plastic plug FFC 22mm



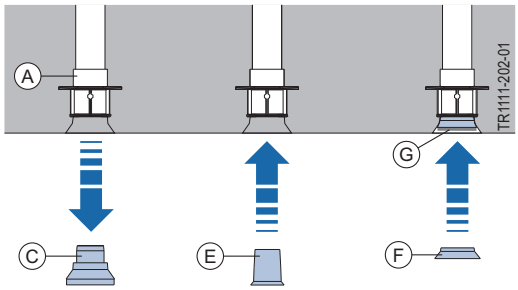
Concrete plug



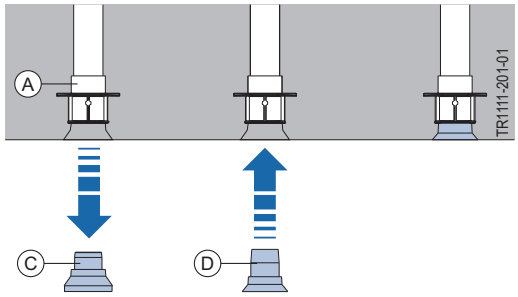
Plastic plug

Fibre-concrete or plastic cone for sealing the finished form-tie point made with the **Distance piece FFC 22mm**.

The plug is glued into place with standard concrete adhesive.



Use with Concrete plug FFC 22mm



Use with Plastic plug FFC 22mm

A Distance piece FFC 22mm (or Tube end piece FFC 22mm and Plastic tube 22mm 2.50m)

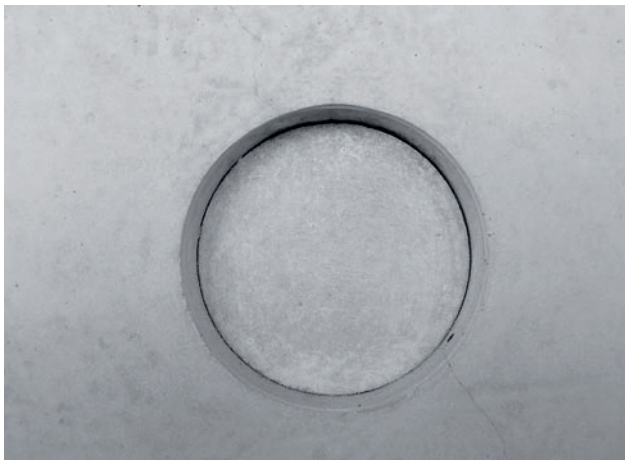
C Yellow Attachable cone with integral Sealing disc 6mm

D Plastic plug FFC 22mm

E Distance-piece plug 22mm

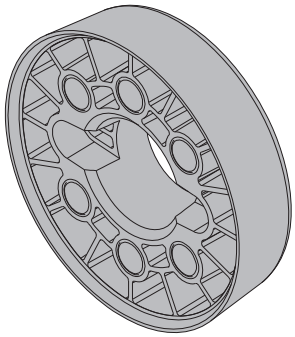
F Concrete plug FFC 22mm

G Component adhesive manufactured by the Nevoga company

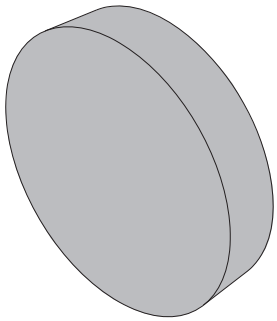


Sealed form-tie point

Framax Xlife plus fair-faced concrete cone 87mm and Fair-faced concrete plug 87mm



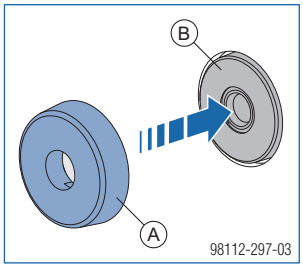
Fair-faced concrete cone



Fair-faced concrete plug

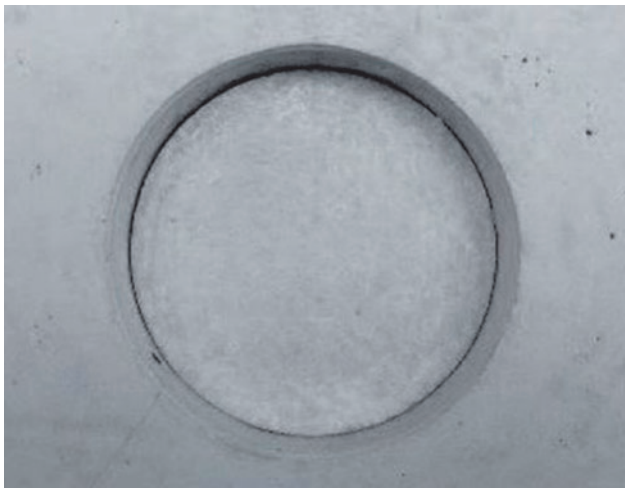
The Framax Xlife plus fair-faced concr. plug 87mm seals form-tie points made with Framax Xlife plus panels and Framax Xlife plus fair-faced concr. cones 87mm (recoverable) (held in place magnetically).

The fair-faced concrete plug is glued into place with standard concrete adhesive.



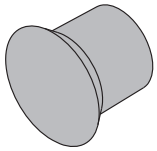
A Framax Xlife plus fair-faced concr. cone 87mm

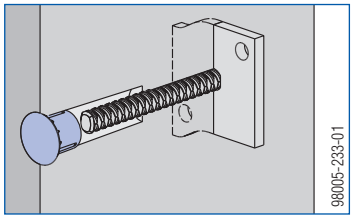
B Anchoring sleeve inside the Framax Xlife plus panel



Sealed form-tie point

Fair-faced concrete plugs 41mm (concrete) and 41mm (plastic)

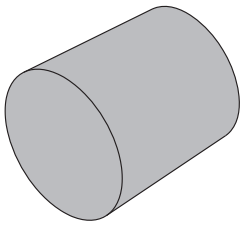




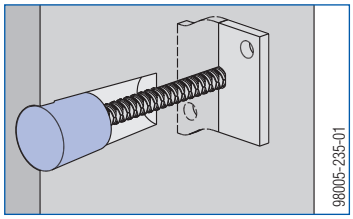
Fibre-concrete or plastic cone for sealing finished form-tie points and suspension points made with the **Fair-faced concrete positioning cone 15.0 5cm** or **Fair-faced concrete positioning cone MF 15.0**.

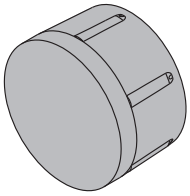
The plug is glued into place with standard concrete adhesive.

Concrete cone 52mm (plastic) and Fair-faced concrete plug 52mm (plastic)

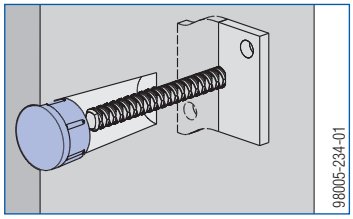


Concrete cone





Fair-faced concrete plug



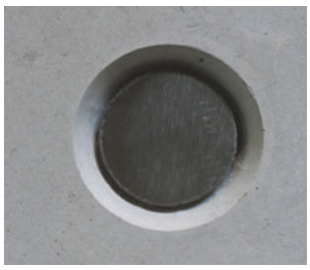
Fibre-concrete or plastic cone for sealing finished form-tie points and suspension points made with the **Universal climbing cone 15.0 5cm**.

The plug is glued into place with standard concrete adhesive.

Additional accessories for fair-faced concrete

Our Fair-faced concrete form-tie points web page https://www.doka.com/at/solutions/sichtbeton-ankerstellen contains an overview of the combination possibilities complete with photos and step-by-step procedures for the various form-tie systems, complete with sealing plugs. Also see our ‘Accessories for fair-faced concrete form-tie points’ samples box.

On request, we can also undertake colour adaptations and surface structuring to suit your in-situ concrete.



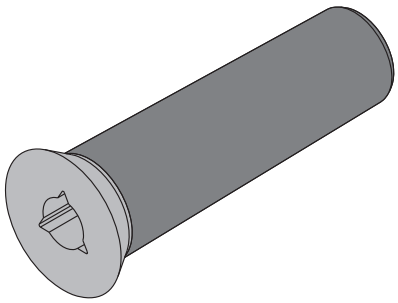
To view the various documents and the ‘Construction accessories’ brochure posted on our website, follow the link below. Part 5 of the brochure contains an overview of all the relevant articles for producing fair-faced concrete surfaces. It also contains, for example, information about suitable reinforcement spacers for fair-faced concrete, sealing possibilities and so on.

https://www.doka.com/at/solutions/Bauzubehoer

Suspension points for working and protection platforms

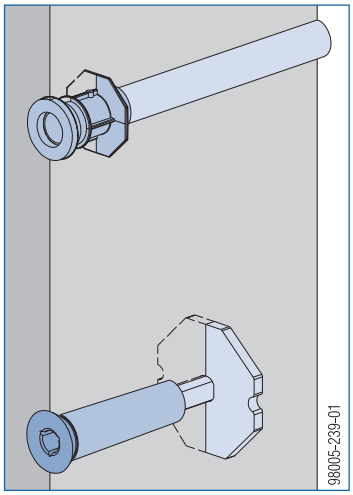
Often, apart from the pre-defined form-tie pattern, the only "imperfections" in a fair-faced concrete surface are suspension points needed for working and protection platforms. However, as working and protection platforms are necessary when several height-sections have to be poured, the suspension points have to be incorporated into the form-tie pattern.

Fair-faced concrete positioning cone 15.0 5cm



The Fair-faced concrete positioning cone 15.0 5cm can be used to incorporate a suspension point for the Folding platform K into the form-tie pattern.

The Fair-faced concrete positioning cone 15.0 5cm leaves behind an identical pattern on the surface of the concrete as the Distance piece FFC, the Tube end piece FFC 22mm or the Universal cone 22mm.



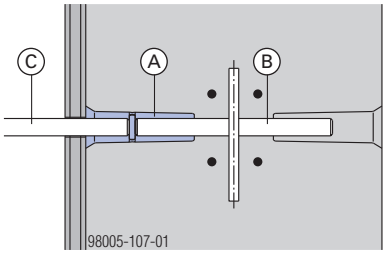
Top: Tube end piece FFC 22mm
Bottom: Fair-faced concrete positioning cone 15.0 5cm

Positioning point

The Fair-faced concrete positioning cone is used as a rod connector for tying the wall formwork.

WARNING

- Screw the tie rods in until they are fully engaged!
- The use of the fair-faced concrete positioning cone is permitted only in the upper area of the form ties (permissible anchor load: 60 kN).

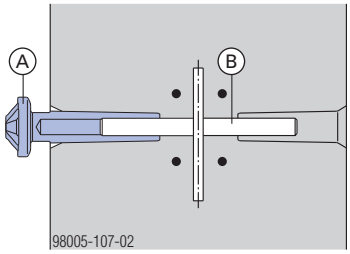


Left: Tying situation
Right: Visual result in concrete

A	Fair-faced concrete positioning cone 15.0 5cm
B	Tie rod 15.0 or Stop anchor double-ended 15.0
C	Tie rod 15.0

Suspension point

Remove the Fair-faced concrete positioning cone 15.0 5cm and screw in the Suspension cone 15.0 5cm.



Left: Tying situation
Right: Visual result in concrete

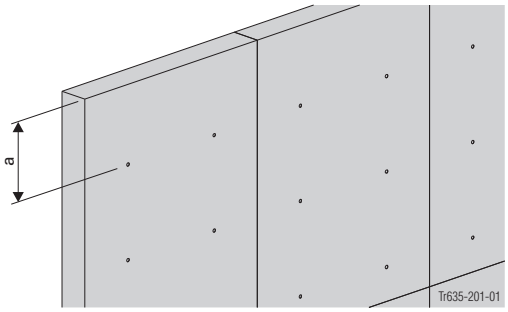
A	Suspension cone 15.0 5cm
B	Stop anchor 15.0

WARNING

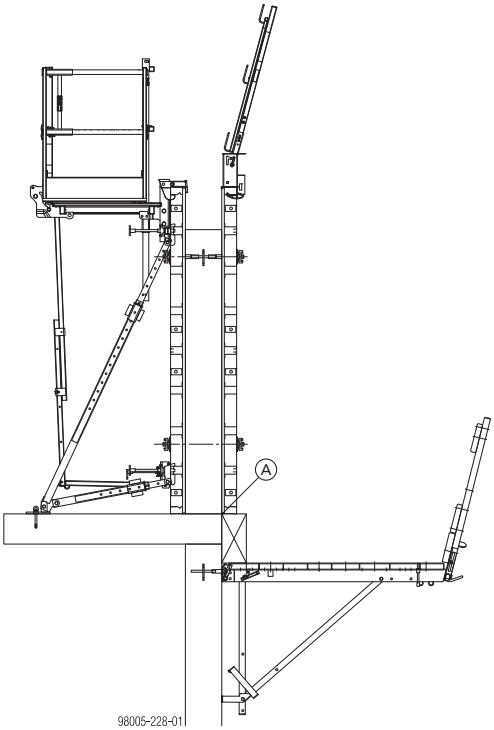
If double-ended Stop anchors 15.0 are used, the following instructions must be followed:

- For correct use, It is essential to place extra reinforcement steel as statically required.
- Never weld or heat tie rods. Risk of breakage!

Result (in terms of appearance): Uniform, regular hole pattern of the form-tie points and suspension points.



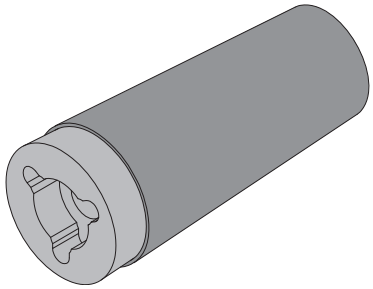
a ... max. 80 cm for suspension points made with the Fair-faced concrete positioning cone 15.0 5cm.



2nd height-section

A	Sealing tape KS 20x5mm on Adhesive tape PVC 50mm (set up formwork for approx. 2 cm overlap with the finished concrete)

Fair-faced concrete positioning cones MF 15.0 and MF 20.0



Also when Climbing formwork MF 240 is used for fair-faced concrete, a common requirement is that the suspension points for the climbing formwork have to be integrated into the form-tie pattern and look like form-tie points. In order to come close to meeting this requirement, the Fair-faced concrete positioning cone MF 15.0 is used for the positioning point.

Form-tie point (diam. 50 mm at surface of concrete):

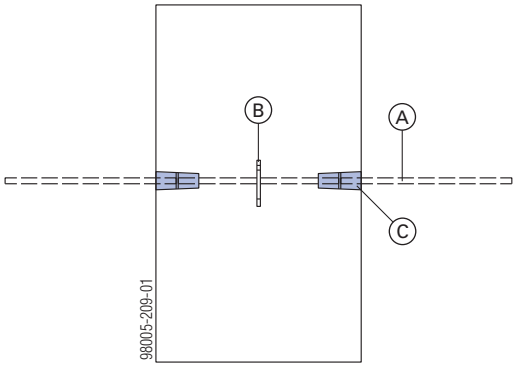
- Plastic tube 32mm
- Universal cone 32mm

Suspension point (diam. 53 mm at surface of concrete):

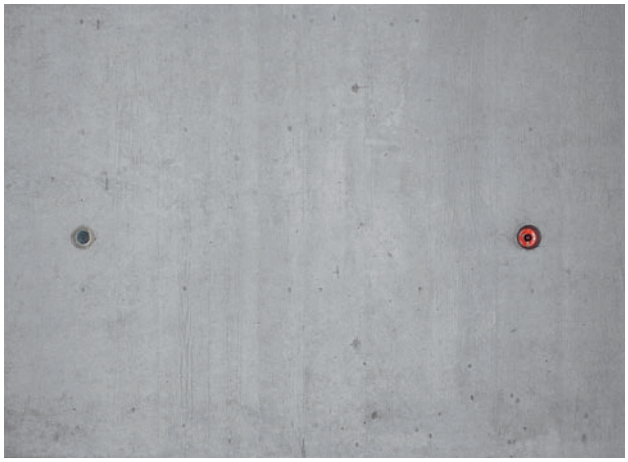
- Fair-faced concrete positioning cone MF 15.0
- Stop anchor 15.0

Positioning point

The Fair-faced concrete positioning cone MF is used as a tie-rod connector for tying the wall formwork.



A	Tie rod
B	Stop anchor, double-sided
C	Fair-faced concrete positioning cone MF

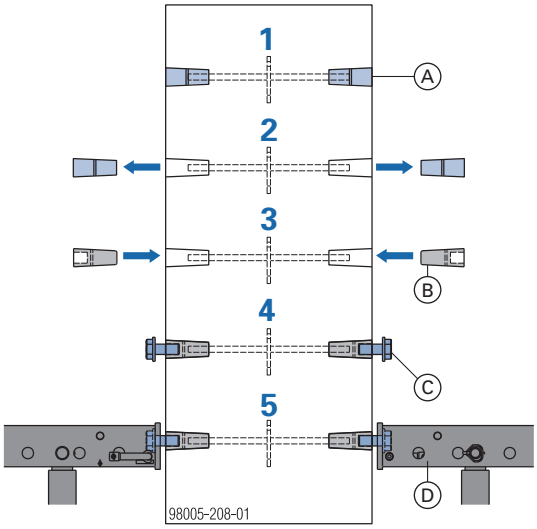


Uniform hole pattern (left: form-tie point - right: suspension point)

Suspension point

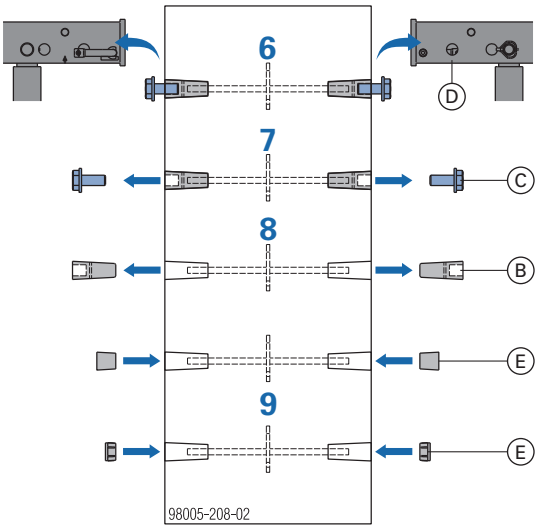
Remove the Fair-faced concrete positioning cone MF 15.0 and install a Universal climbing cone 15.0 and a Cone screw B 7cm.

Installation



Finished suspension point for Climbing formwork MF240

Removal



A	Fair-faced concrete positioning cone MF 15.0
B	Universal climbing cone 15.0
C	Cone screw B 7cm
D	Climbing bracket MF
E	Concrete cone 52mm or Fair-faced concrete plug 52mm plastic

Note:

Form tie and suspension are on the same level. Check for collision!

For more information see the ‘Climbing formwork MF240’ User Information booklet and the ‘Overview of suspension points” brochure.

Joint between formwork sheets

The edges of the formwork sheets are either sealed (rough surface) or untreated (absorbent). This can lead to seepage of cement slurry or result in the sheet swelling at the edges.

3-SO sheets do not need to have their edges sealed.

The possibilities for preventing seepage of cement slurry (which would cause swelling of the sheets) are as follows:

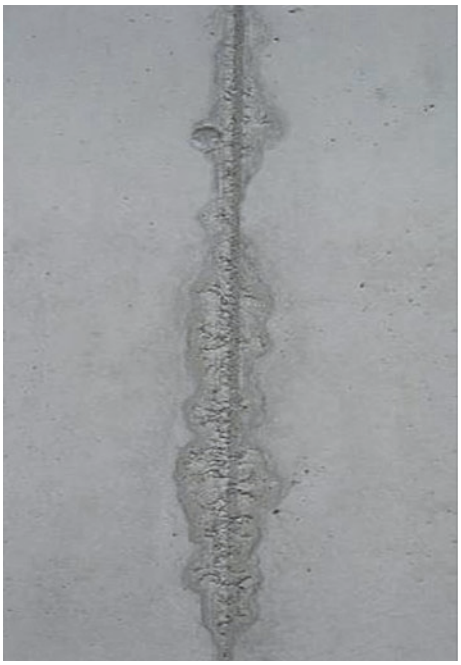
Version 1:

- ➤ Apply grey silicone sealing compound or acrylic compound to the face sides of the formwork sheet. Due to their stickiness, transparent sealing compounds are not recommended.
- ➤ Press the sheets tightly together at the joints.
- ➤ Allow the silicone or acrylic compound enough time to dry.
- ➤ Trim off excess compound with a sharp knife.

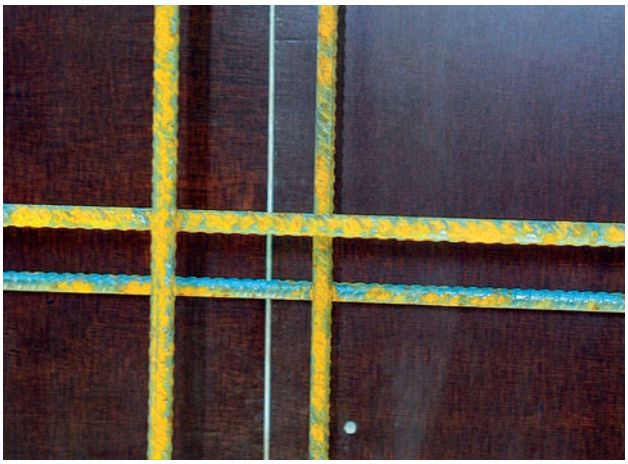
Version 2:

- ➤ Affix open-pore foam sealing tape along the face sides of the formwork sheet.
- ➤ Trim off excess on the side facing the concrete.

This measure prevents the surface defects shown here from occurring.



Seepage of cement slurry



Sealed joint between Dokaplex sheets

Appearance of concrete at joint (sealed) between sheets

Links to the ‘Sealing element joint’ YouTube video:

German

Click here...

English

Click here...

Joints between formwork elements/panels

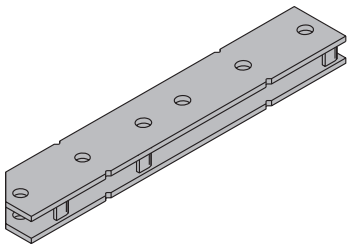
Wood shrinks and swells, so the thickness of formwork sheets and timber beams can change. This, in turn, can cause mismatches at the joints between adjacent panels.

Example: Mismatch at the joint between adjacent panels

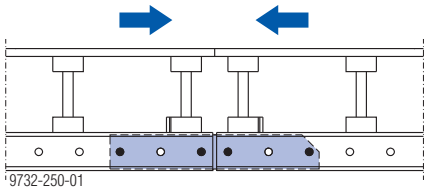
Appearance of the concrete due to mismatch at the joint between adjacent panels

Formwork element connector FF20/50 Z

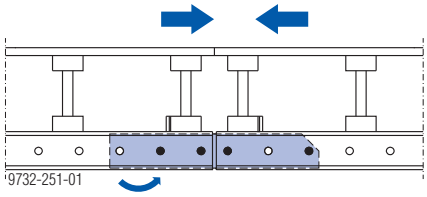
- joins and aligns timber-beam formwork elements in the longitudinal
- Also, the inter-element joint can be pulled tight in two stages where needed



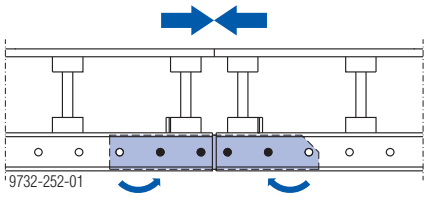
To fit normally



To pull tight half the way

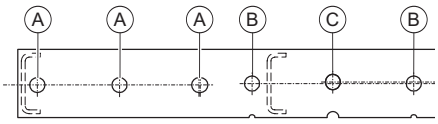


To pull tight all the way



Custom support plate with pull-tight and mismatch-compensation functions

This splice plate combines two functions in order to compensate for the tolerances that are unavoidable whenever timber products are used.



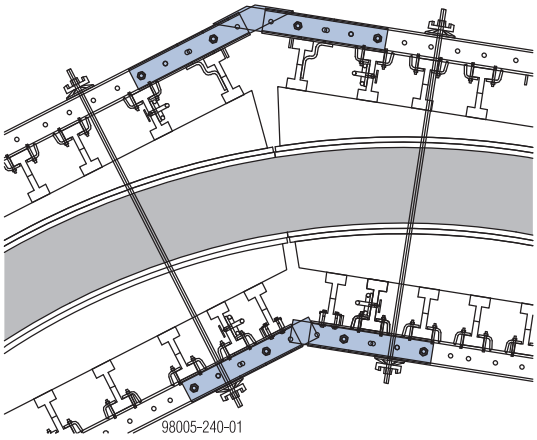
A	Pull-tight function like Formwork element connector FF20/50 Z (1.5 mm of pull)
B	Mismatch-compensation function (2 mm of compensation)
C	Mismatch-compensation function (4 mm of compensation)

Half splice plate

Half splice plates are used for fabricating low-cost corner plates, with any angle and for both inside and outside corners, directly on the site.

Two Half splice plates are needed for one corner plate. The plates are welded together at the required angle after the formwork has been set.

Mismatches between adjacent panels are eliminated to a large extent because the plates are not adapted until after the formwork has been set.



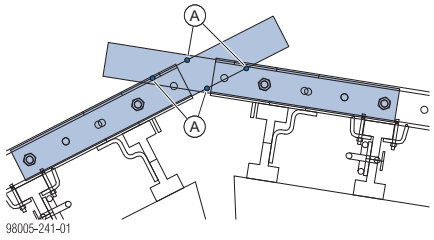
Installation

WARNING

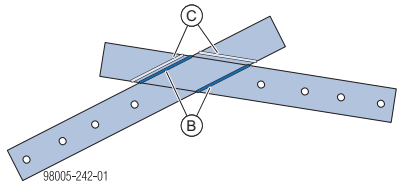
➤ The user is responsible for the integrity of the welded joint!

➤ Set and secure the formwork.

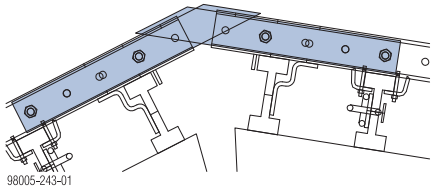
➤ Pin the two Half splice plates into position and structurally join the two plates together (by tack welding) **(A)** .



➤ Remove the tack-welded assembly, weld the two half plates together along the full length of the joint **(B)** and then shorten to length **(C)** .

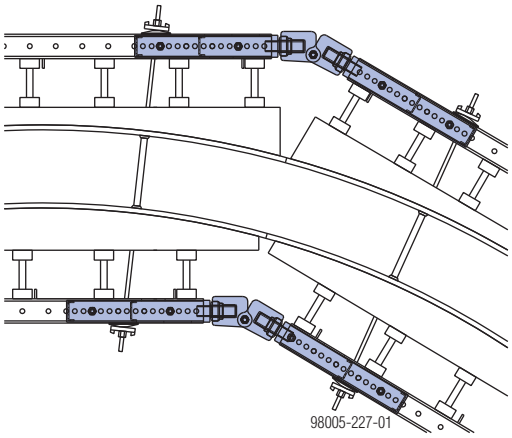


➤ Pin the finished corner plate into position as inter-panel connector.



Swivel joint plate

For making curved formwork from Large-area formwork Top 50.



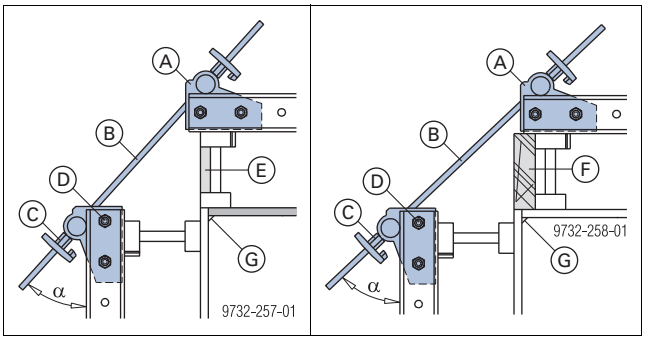
Outside corner with Universal angle tie bracket

The panels are clamped together with Universal angle tie brackets and Tie rods 15.0.

Permitted anchor tensile force: 90 kN

NOTICE

Statical proof of the multi-purpose waling used is required!



α ... 23° - 64°

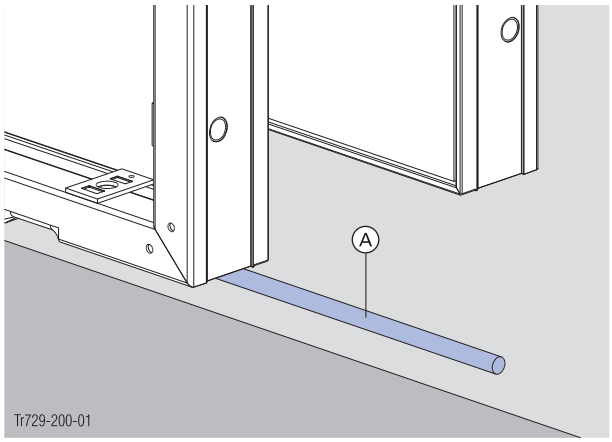
A	Universal angle tie bracket
B	Tie rod 15.0
C	Wing nut 15.0
D	Connecting pin 10cm
E	Flange reinforcement
F	Plank
G	Triangular ledge (wood if the sheeting is absorbent, plastic for non-absorbent sheeting)

Seal between wall and base plate or slab

Unevenness in the base plate / slab can lead to extensive seepage of fine-grained mortar along the construction joint between the slab and the wall, which in turn results in the formation of large rock pockets.

A Sealing string D2cm laid on the base plate / floor-slab prevents this.

The Sealing string D2cm compressed between the slab and the wall formwork prevents fine-grained mortar from seeping out of the formwork at the bottom of the wall.



A Sealing string D2cm

Result with sealing string

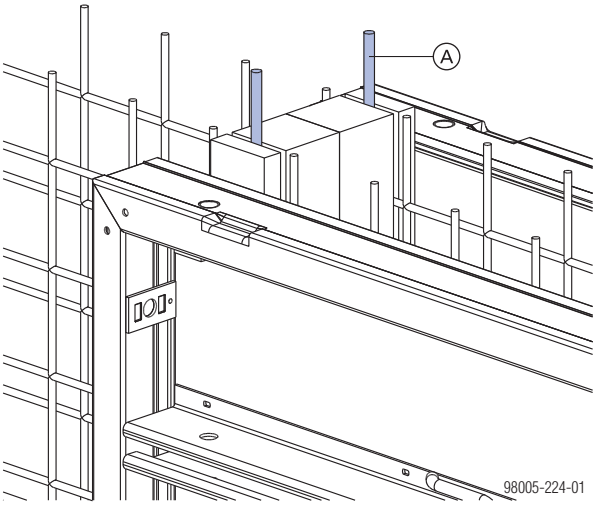
Result without sealing string

Sealing the stop-end formwork

At construction joints in the wall with reinforcement lead-throughs, special attention must be paid to preventing concrete seepage and the resulting formation of rock pockets.

Clamping and compressing the Sealing string D2cm between the stop-end formwork and the reinforcement prevents seepage of fine-grained mortar. Depending on the thickness of the reinforcement, the sealing string can be used on one or both sides of the reinforcement.

Stop-end formwork with sealing string



A Sealing string D2cm

Result when stop-end formwork is sealed

Result when stop-end formwork is not sealed

Sealing vertical construction joints

At vertical construction joints, simply pressing the formwork on to the previous pouring section is often not sufficient to keep fine-grained mortar from seeping out on to the finished section of wall.

Sealing tapes are the remedy here:

- Sealing tape KS 20x5mm for Framed formwork Framax Xlife, Alu-Framax Xlife or Framax Xlife plus
- Sealing tape KS 10x3mm for timber-beam formwork

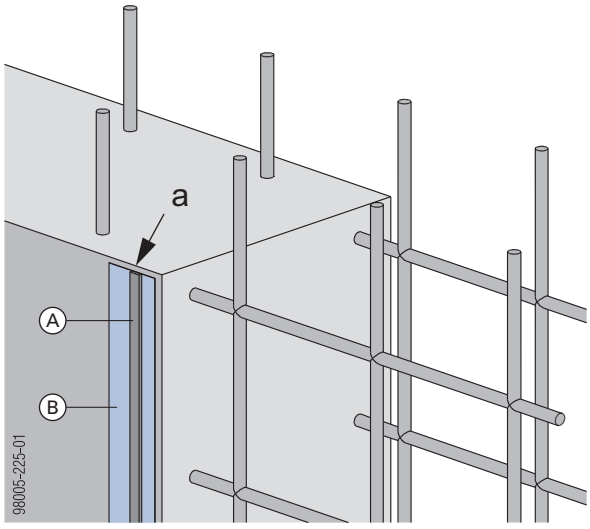
To seal the vertical construction joint:

➤ Apply Adhesive tape PVC 50mm to the concrete along the construction joint.

➤ Apply Sealing tape KS 20x5mm or Sealing tape KS 10x3mm, as appropriate, to the Adhesive tape PVC 50mm.

➤ Press the formwork against the wall to compress the sealing tape between wall and formwork.

- Adhesive tape PVC 50mm has to be affixed to the wall first because the Sealing tapes KS adhere very tightly to concrete and usually cannot be removed cleanly.
- Keep formwork overlaps on the finished concrete as small as possible, but not less than 5 cm.



a ... 1 - 2 mm

A Sealing tape KS 20x5mm 10m or, as applicable, 10x3mm 10m

B Adhesive tape PVC 50mm 33m

A small bead **a** of 1 to 2 mm remains visible on the surface. This positive imprint results from the remaining thickness of the sealing tape after it has been compressed between the formwork and the concrete.

Links to the 'Sealing construction joint' YouTube video:

German

Click here...

English

Click here...

Construction joint made with sealing tape

Construction joint made without sealing tape

Sealing horizontal construction joints

At horizontal construction joints, simply pressing the formwork on to the previous pouring section is often not sufficient to keep fine-grained mortar from seeping out on to the finished section of wall.

Sealing tapes are the remedy here:

- Sealing tape KS 20x5mm for Framed formwork Framax Xlife, Alu-Framax Xlife or Framax Xlife plus.
- Sealing tape KS 10x3mm for timber-beam formwork

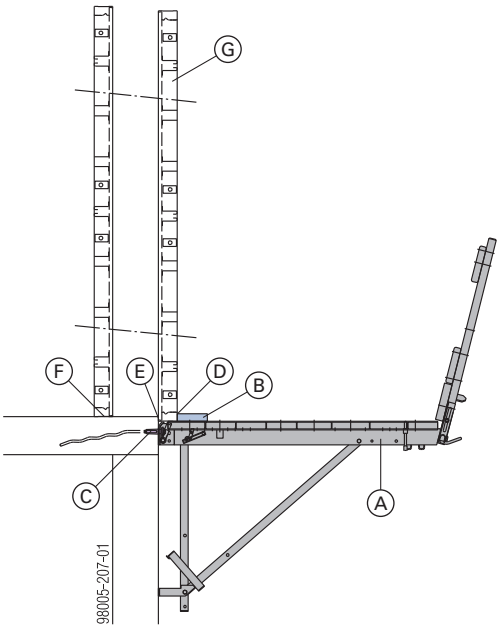
To seal the horizontal construction joint:

➤ Apply Adhesive tape PVC 50mm to the concrete along the construction joint.

➤ Apply Sealing tape KS 20x5mm or Sealing tape KS 10x3mm, as appropriate, to the Adhesive tape PVC 50mm.

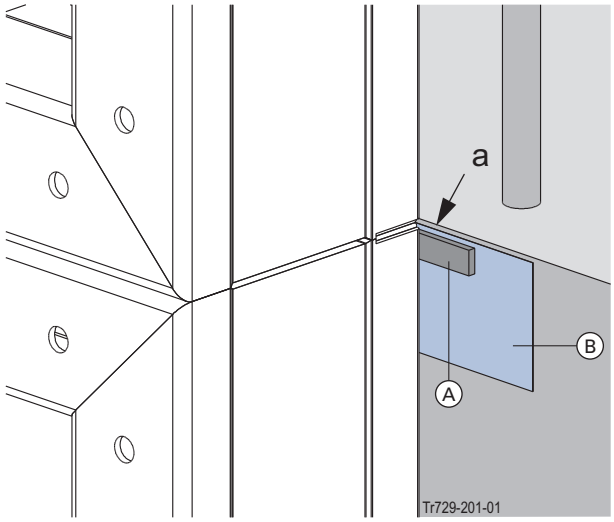
➤ Press the formwork against the wall to compress the sealing tape between wall and formwork.

Adhesive tape PVC 50mm has to be affixed to the wall first because the Sealing tapes KS adhere very tightly to concrete and usually cannot be removed cleanly.



Arrangement with Folding platform K and Framax framed formwork

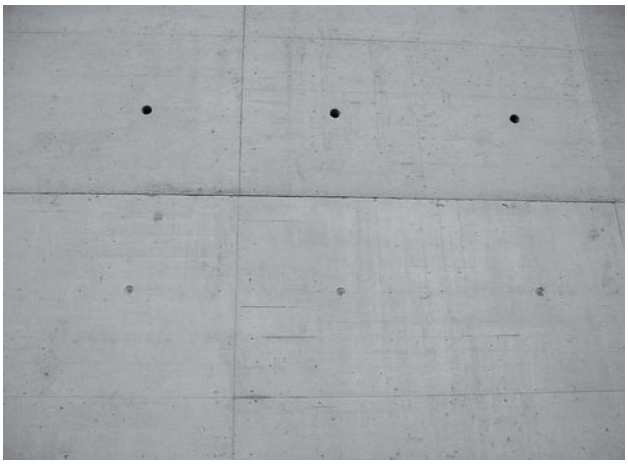
A	Folding platform K
B	Plank (fixed to decking)
C	Suspension cone (wedged for zero clearance)
D	Wedged
E	Sealing tape KS 20x5mm on Adhesive tape PVC 50mm
F	Sealing string D2cm
G	Offset of the outside formwork approx. 15 mm



a ... 1 - 2 mm

A	Sealing tape KS 20x5mm 10m or, as applicable, 10x3mm 10m
B	Adhesive tape PVC 50mm 33m

A small bead of 1 to 2 mm remains visible on the surface. This positive imprint results from the remaining thickness of the sealing tape after it has been compressed between the formwork and the concrete.



Horizontal construction joint cast with sealing tape

Forming-operations on the site

Organising a fair-faced concrete project

We have found that it is a good idea to attend to the following points before work starts at a fair-faced concrete construction site:

- Drawing up a joint quality assurance "action list" with all the firms involved
- Clarifying "who is responsible for what" (fair-faced concrete team)
- Training the site crew of all the firms involved, and raising awareness of the problems
- Casting a test wall. This is an opportunity for trying out different kinds of formwork sheeting and release agents with the specified type of concrete.

Storage after delivery

From the moment the formwork is delivered to the site, make sure that it is properly stored and protected.

Covering

Covering the formwork keeps it protected from:

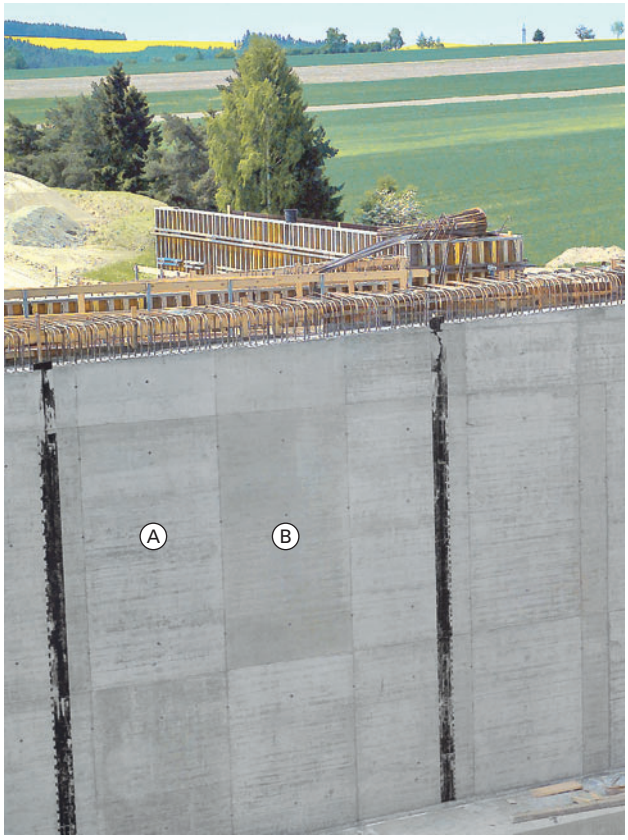
- the weather (sun, rain, snow)
- soiling caused by site traffic

When covering the formwork, make sure that it is still adequately ventilated (this is especially important if it is being stored for long periods). If not enough air can get to the formwork, condensation or existing moisture on the formwork can cause mildew (mould) to form.

Example: Formwork elements stored without any protection from the weather

The formwork sheeting of the top panel is exposed to the sun, so it dries out more than the sheeting of the subjacent panels.
This makes the formwork sheet of the top panel considerably more absorbent.

Result: Concrete discolouration



A Panel was underneath in stack (low absorbency of the sheeting)
B Panel was at the top in stack (high absorbency of the sheeting)

Rust

After prolonged storage and useage, framed formwork panels whose frames are not hot-dip galvanised both inside and out may develop rust-spots which are then left behind on the concrete surface after forming.
With Doka products, all steel parts in contact with the concrete are hot-dip galvanised and/or powder-coated, so there is no danger of rusting.

Site traffic

- Store fair-faced concrete formwork well away from site traffic, to prevent it being damaged and soiled by traffic.
- For more information about the right way to handle fair-faced concrete formwork Click here.

Pre-treatment of the formwork

Absorption behaviour of the formwork sheets

The absorbency of formwork sheets varies, depending on type of sheet, degree of usage and moisture content. This produces colour differences on the concrete surface.

Remedy

All absorbent sheeting benefits from being pre-treated before the first pouring section.

- Even, thin application of cement slurry or fine-grained mortar to the sheeting.
  - Allow to dry and wipe off the fine-grained mortar.

Benefits:

- Pores are closed.
- Uniform absorbency of the formwork sheets.
- Irregularities on the concrete surface such as those caused by resin pockets, knots etc. are less noticeable than they would be without pretreatment.
- Wood sugar of uncoated boards is reduced or neutralised.

Another way of achieving the same result would be to use the formwork once or twice on less important parts of the structure first, before actually using it to cast fair-faced concrete.

Re-using formwork

To prevent colour differences on the concrete surface (due to differences in absorbency), observe the following points:

- Always use formwork panels with formwork sheeting of the same type.
- Whenever possible, use formwork panels that have had the same degree of usage.

Release agents

Many trials and empirical findings in recent years have shown that the release agent and its use have a significant effect (which can be either positive or negative) on the fair-faced concrete result.

Types of release agent:

- Mineral oil or vegetable oil without additives
- Mineral oil or vegetable oil with additives (**Doka-Trenn**)
- Release-agent emulsions (mineral-oil and vegetable-oil basis)
- Release-agent emulsions with antifreeze (mineral-oil and vegetable-oil basis) (**Doka-OptiX**)

The type of release agent that works best depends on the formwork sheeting, the concrete formulation and the temperatures prevailing when the concrete is poured.

As a general rule, release agents should be tested and their effects assessed before they are cleared for use in the casting of fair-faced concrete walls or slabs.

The table below shows which types of release agent are suitable for which types of formwork sheeting and temperatures, and how they should be used.

Before applying the release agent, check the sheeting for resin pockets and remove if necessary.

Overview: formwork sheeting, seasonal conditions and suitable release agents

Release agent types	Formwork sheeting and climatic conditions									
	Summery ambient temperatures +15 to +35 °C					Wintry ambient temperatures -4 to +14 °C				
	Xface	Xlife	Dokaplex	3-SO	Wooden-board formwork	Xface	Xlife	Dokaplex	3-SO	Wooden-board formwork
▪ Mineral oil or vegetable oil ▪ **without** additives ▪ spray on and wipe down										
▪ Mineral oil or vegetable oil ▪ **with** additives ▪ spray on and wipe down e.g. Doka-Trenn										
▪ Aqueous emulsions usable down to ambient temperatures of +5 °C ▪ spray on										
▪ Aqueous emulsions usable down to ambient temperatures of -4 °C ▪ spray on e.g. Doka-OptiX										
▪ without release agent	max. 5 pourings					max. 5 pourings				

Suitability	
	Very good
	good
	poor

Applying release-agent

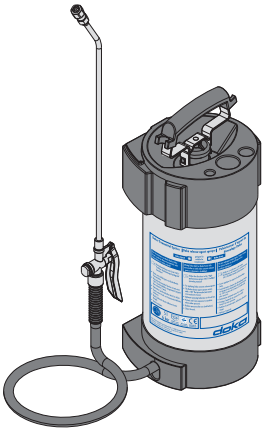
Mode of application

The right way of applying release agent is by means of a sprayer with a flat-jet nozzle that applies a finely atomised spray to the formwork sheeting.

Do not use round-jet nozzles, clogged or damaged nozzles, because they often apply too much release agent.

Clean the flat-jet nozzle prior to use to achieve as fine a spray as possible. Pump the sprayer up to a pressure of at least 4 bar.

Sprayer:



Doka sprayer for release agent

Spraying a formwork panel

Application dosage

Note:

Adapt the amount of release agent applied to the situation and to the formwork being used.

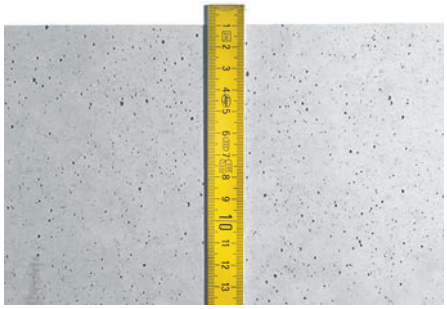
Follow the manufacturer's instructions!

The basic rule is to apply as little release agent as possible to the formwork.

A thin application of release agent generally results in a better concrete surface.

Concrete result:

Quantity of release agent applied 10 g/m²



Quantity of release agent applied 30 g/m²

Quantity of Doka-Trenn applied

Doka-Trenn is ideal for non-absorbent (Xface, Xlife sheets, etc.) and slightly absorbent sheeting (Dokaplex formwork sheet, etc.). Apply as little of the release agent as possible and allow it to evaporate sufficiently before using the formwork.

Particularly on smooth formwork sheeting, you can easily find out whether the optimum quantity of agent has been applied by doing a ‘fingertip test’:

Right quantity applied

Too much release agent applied

After applying the release agent, run a rubber squeegee, rubber wiper or cloth evenly and cleanly across the formwork to remove localised excess.

Quantity of Doka-OptiX applied

Doka-OptiX is an aqueous white emulsion. It should be applied thinly to the formwork sheeting. In a short time the film changes from white to transparent, after which it is ready for use.

Link to the ‘Applying release agent’ YouTube video:

Click here...

Positioning the formwork

Walls

Holding side / closing side of the formwork

If fair-faced concrete criteria apply to only one face of a wall, it is important to consider whether the holding side or the closing side of the wall formwork should be on the fair-faced concrete side of the wall.

Advantages of the holding side:

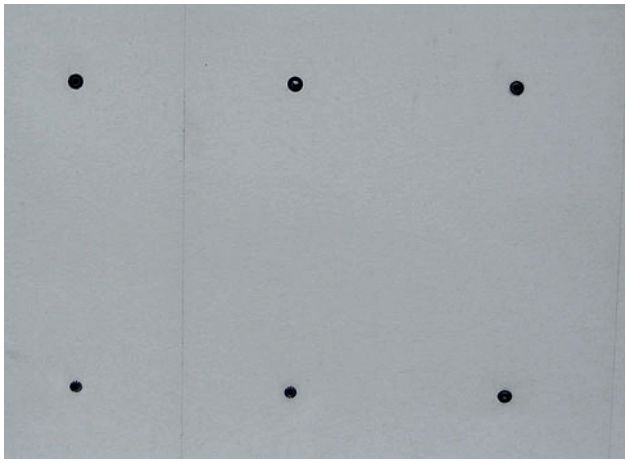
- The formwork can be measured up more easily and more accurately (e.g. panel size-grid, form-tie pattern)
- it is easier to seal the formwork and the form-tie points
- Checks are more straightforward

Disadvantages of the holding side:

- More pronounced effect of the weather
- Possibly more risk of soiling from site traffic
- Risk of damage from reinforcement operations (sheeting scratched, marked by rust from the reinforcement steel, etc.)

If fair-faced concrete requirements apply to both faces, it is advisable to treat the holding-side and closing-side sets of formwork alike, for example the release agent should be applied to both sets at the same time. The closing side then has to be stored protected against weathering until it is going to be used. The sets of formwork for both sides are therefore equally conditioned.

Holding side, soiled



Closing side, unsoiled

Damage during setting and aligning

- Using a rubber mallet for setting and aligning prevents damage.
- Framed formwork Framax Xlife and Framax Xlife plus have a setting recess in the frame profile so that the framed formwork can be aligned using a pinching bar.

Sealing the formwork

For practical examples of how to seal the formwork at joins and stop-ends, see the section headed "Design details of formwork"!

Floor-slabs

Causes of soiling on floor-slab formwork:

- **Rust:**
  Because the reinforcement steel rests on the slab formwork for longer, rusty water dripping off the reinforcement often marks the formwork sheeting. It has been found helpful to use non-rusting reinforcements here.
- **Personnel movement, storage:**
  As the members of the site crew have to move around on the floor-slab formwork and put down tools on it while they are working, the following points must be remembered and prevented:
  - Shoe-prints left on the formwork can be transferred to the concrete surface, where they might well be visible.
  - When tools etc. are left for long periods on the sheeting, in rain or sunshine, this can lead to discolouration on the visible underside of the slab.
  - Remove all soiling (including nails, wire from the reinforcement operations etc.) before pouring, as otherwise they will be visible on the face of the slab.
  - Vibrators used without protective rubber caps damage the sheeting. Signs of this damage are visible on the finished concrete.

Slab showing vibrator damage

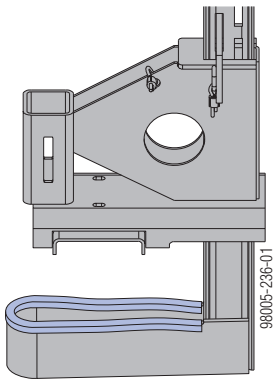
Concrete discolouration caused by an aluminium levelling rule being left on the formwork sheeting

Compliance with the following points make the specified fair-faced concrete result easier to achieve:

- Only persons who are directly involved in work with floor-slab formwork should be allowed to be on the formwork.
- Do not use floor-slab formwork as a transit route or as a storage flat.
- Everyone who has to move around on floor-slab formwork must wear new or cleaned footwear or are provided with overshoes (plastic, felt). This footwear has to be removed and other footwear substituted when the wearer steps off the floor-slab formwork
- If possible, do not scrape reinforcement steel against other reinforcement that is already in place (fly rust).
- If possible, do not set down reinforcement steel on formwork sheeting.
- If possible, do not step on reinforcement steel after it has been put in place.
- Use a release agent that forms a non-sticky film (easier final cleaning).

There is a risk of scratching the underside of the slab when installing railing clamps for slab-edge railings.

This can be avoided by fitting the handrail clamps with commercially available plastic edge protection profiles.



Stripping the formwork

Note:

- The concrete dwell-time in the formwork should be the same for all fair-faced concrete surfaces.
- When temperatures are high, do not leave the concrete inside the formwork for too long.
- The formwork should be stripped "in one go".
- After loosening the form ties, immediately remove the formwork elements or panels from the concrete. Otherwise, condensation can soil the surface of the concrete and under certain circumstances might even cause dark stains. This applies for multi-ply sheets with phenolic resin coating, e.g. Dokaplex or other-make sheets.

Soiling caused by condensation

- Separate the formwork from the concrete as gently as possible, using a rubber mallet. This prevents damage that can affect subsequent formworking operations.
- Leave sharp-edged corners enclosed in the formwork for longer (until the concrete attains greater strength), to prevent damage when the formwork is stripped.

Also see the section headed ‘Concremote’.

Cleaning the formwork

Clean the formwork immediately after it has been stripped.
The choice of suitable cleaning tools depends on the type of formwork sheeting:

Plastic-coated plywood sheet (Xlife, Xface sheet)

- High-pressure spray cleaner with rotary attachment
- Plastic scraper
- Cloths

Rotary cleaner

Phenolic resin-coated plywood sheet

- Brush
- Cloths
- Use plastic scrapers and high-pressure spray cleaners only if the coating is intact (try out beforehand to get the correct pressure setting!)
  The high-pressure water jet or plastic blade would worsen existing flaking in the coating.

3-ply sheets, board-type facing

- Brush
- Cloths
- Use high-pressure spray cleaners only at very low pressure settings, so as to not to ruin the wood structure of the 3-ply sheets or board-type facing.

Clean panels with water (or release agent) and cloths, because neither scrapers nor brushes will completely remove all soiling.

Contact surfaces, connecting devices

Do not forget to clean the contact surfaces of the formwork elements/panels and the connectors. Otherwise the tightness of the joints between formwork panels cannot be ensured.

- The contact surfaces of framed formwork, the stacking flanges of Wall formwork FF20, and various connectors can all be cleaned with the high-pressure spray cleaner.
- The end faces of the formwork sheets of timber-beam formwork must be cleaned as gently as possible, for example with a plastic scraper.

Intermediate storage

Between the individual pouring sections, when possible store the cleaned formwork panels upright.

To do this, stand the formwork panels in pairs with the formwork sheet sides toward each other a few centimetres apart. In this way, the panels protect each other against the weather.

Protect phenolic-resin-coated sheets of all makes (e.g. Dokaplex formwork sheets) against moisture (rippling) and direct sunlight on the side that faces the concrete (brown staining).

WARNING

Also ensure that the formwork elements or panels are standing stably when they are in intermediate storage.

➤ Secure them with panel struts and Doka express anchors 16x125mm.

Also see the section headed ‘Storage after delivery’.

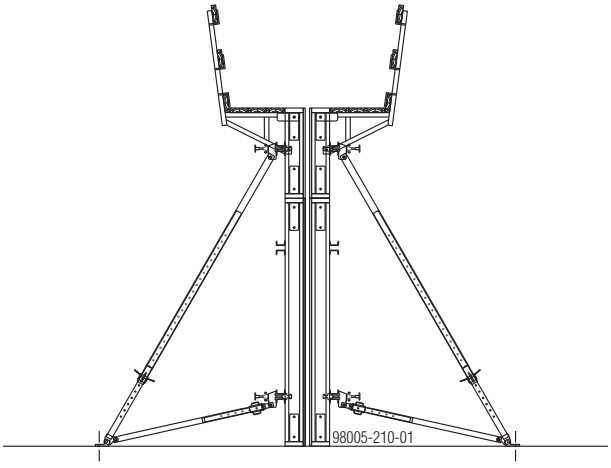


Illustration of a pair of panels

Curing

The measures needed for curing the concrete should be specifically agreed with the concrete supplier for each site (due to the differing climatic influences and environmental conditions).

Protecting the fair-faced concrete wall

After the formwork has been struck, protect the fair-faced concrete walls against damage and soiling.

Protection where work and protection platforms are used

Fit a non-absorbent protective cover to the pressure points of work and protection platforms.

Protected suspension point

Protected pressure point

Protection against soiling

Use plastic sheeting to protect fair-faced concrete surfaces from soiling (e.g. by rust from starter bars, weathering etc.).
Do not allow the protective plastic sheeting to be in direct contact with the concrete, as this might cause discolouration on the surface of the concrete.

Protecting the starter bars (rust)

Protecting the starter bars (rust)

Protecting edges and corners

The risk of the fair-faced concrete surfaces being damaged by on-site handling of equipment and materials is very considerable, especially at edges and outside corners. For this reason, these should stay protected until work finishes on the site.

Edges protected, but lack of seal at the slab formwork

Protecting fair-faced concrete surfaces against being written on

Once the actual construction work has finished, it is advisable to put up protective warning signs on the fair-faced concrete surfaces, reading e.g. "Warning: Fair-faced concrete! Do not mark or write on this surface!"

Protective warning sign for fair-faced concrete wall

- Inform all the firms who will be doing the interior fitting work (electricians, tilers, plumbers etc.) which of the walls are fair-faced concrete surfaces and must thus be given special protection against soiling and damage etc.
- Hydrophobisation of the fair-faced concrete surfaces and graffiti protection help protect against water soiling and vandalism.

Doka services

Doka services

Consulting

- Analysing the scope of the assignment from the start of the project tendering phase
- Advice regarding pre-selection of possible formwork systems, taking constructional details into account
- Submission of price quotations
- Support at preparatory technical meetings with architects and other key parties on the subject of fair-faced concrete
- Special customer training events on fair-faced concrete

Contact:

Planning service

- Developing custom solutions on the basis of the agreements made in the course of advice and consulting
- Designing the custom formwork solutions using advanced CAD software, also as 3D graphics when needed
- Drawings for the execution planning
- Visualisation of visible surfaces
- Ongoing, “on-the-job” planning for the formwork cycle sequences
- Ongoing, “on-the-job” visualisations of the architectural surfaces
- Drawing up any necessary formwork-related statical calculations
- Assistance with drawing up any quality assurance plan which may be necessary

Ready-to-Use Service / formwork-making

- Pre-assembly of the ordered project-specific formwork in Doka's own Pre-assembly Service workshops
- Dismantling of the ordered project-specific formwork

The highest possible standard is rigorously maintained in the production of fair-faced concrete elements and panels. Assembly and transfer to trucks for transport are documented; the logs are available on request. We are also happy to tender for additional services such as packaging of the panels and trial assembly.

Minor defects, related to assembly procedures and materials used, can occur nonetheless.

- Slight tolerances are unavoidable in the fabrication of wood-based products.
- When Dokaplex or DokaPly Birch formwork sheets are used, slight rippling can occur as can brownish discolouration of the concrete surface, as is also the case with all commercially available formwork sheets with phenolic-resin coatings.
- Slight cracking in the surface of the formwork sheeting.

These minor defects do not justify complaints!

Tips to help prevent on-the-job difficulties

- Until they are going to be used, store panels level and protected against moisture, soiling and direct sunlight.
- Keep periods of storage on site as short as possible.
- Use suitable slinging means for transport (edge protection and textile straps instead of chains).
- Check the pre-assembled panels for defects immediately on delivery. Later complaints will not be accepted.

Site support

- Instruction of site crew by experienced Formwork Instructors
- On-site service by formwork technology advisers
- Provision of the detailed User Information booklets for the formwork systems
- Advice regarding continued use of the formwork systems in the course of further construction
- Support at technical meetings on fair-faced concrete held with architects and other key parties in the course of further work on the site

You can find more information on the Internet at **www.doka.com/sichtbeton**

Concremote

Concremote - the construction method for fair-faced concrete projects to ensure similar concrete colour tones and high-quality concrete surfaces.

This method is eminently suitable for projects with fair-faced concrete surfaces and the associated high requirements. The objective is to achieve uniformity of the concrete surface and also across all the work procedures. This method also helps building contractors deal with changing weather conditions that need special consideration. Gapless, end-to-end documentation – progress of construction, data on temperature and strength development, composition of the concrete and so on – fulfils the project owner's requirements "in passing".

Use of the cable sensor

Common reasons for use in fair-faced concrete construction:

- Uniform grey tone or colour
- Avoidance of dark staining or blackening
- Avoidance of spalling at the surface of the concrete and the edges when the formwork is stripped
- Control of concrete curing

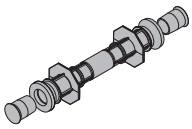
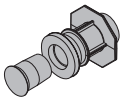
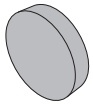
Advantages

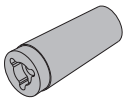
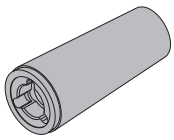
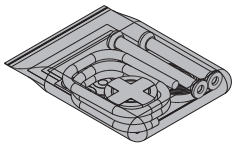
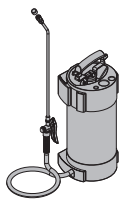
Enhance concrete quality	Reduce costs
▪ Higher probability of similar colour tones ▪ High-quality concrete edges and surfaces	▪ Less touching up of the concrete

Reference site KTM museum Mattighofen, Austria

Link to the latest versions of the operating instructions and the user manual

Click here...

	[kg]	Article N°
Sealing disc 20/43 20.0/26.5	**0.002**	**581836000**
Sealing disc 30/50	**0.003**	**581837000**
Sealing disc 30/53	**0.003**	**581838000**
Dichtscheibe		
Black		
		
Distance piece FFC 22mm 20cm	**0.06**	**581843500**
Distance piece FFC 22mm 25cm	**0.06**	**581844500**
Distance piece FFC 22mm 30cm	**0.07**	**581845500**
Distanzhalter FFC 22mm		
PE		
Grey		
Yellow		
		
Tube end piece FFC 22mm	**0.03**	**581860000**
Rohrendstück FFC 22mm		
PE		
Grey		
Yellow		
		
Concrete plug FFC 22mm	**0.01**	**581863000**
Betonstopfen FFC 22mm		
Grey		
		
Plastic plug FFC 22mm	**0.01**	**581862000**
Kunststoffstopfen FFC 22mm		
PE		
Grey		
		
Framax Xlife plus fair-faced concr. cone 87mm	**0.09**	**589282000**
Framax Xlife plus-Sichtbetonkonus 87mm		
Blue		
		
Framax Xlife plus fair-faced concr. plug 87mm	**0.19**	**589283000**
Framax Xlife plus-Sichtbetonstopfen 87mm		
Grey		
		
Fair-faced concrete plug 41mm plastic	**0.007**	**581851000**
Fair-faced concrete plug 41mm concrete	**0.05**	**581848000**
Sichtbetonstopfen		
Grey		
		
Concrete cone 52mm	**0.19**	**581939000**
Betonkonus 52mm		
Grey		
		
Fair-faced concrete plug 52mm plastic	**0.01**	**581850000**
Sichtbetonstopfen 52mm Kunststoff		
PE		
Grey		
		

	[kg]	Article N°
Fair-faced concrete positioning cone 15.0 5cm	**0.46**	**581973000**
Sichtbetonvorlauf 15,0 5cm		
Galvanised		
Length: 11 cm		
Diameter: 4.3 cm		
		
Fair-faced concrete positioning cone MF 15.0	**1.5**	**581928000**
Sichtbetonvorlauf MF 15,0		
Galvanised		
Length: 12.6 cm		
Diameter: 5.3 cm		
		
Fair-faced concrete positioning cone MF 20.0	**1.3**	**581469000**
Sichtbetonvorlauf MF 20,0		
Galvanised		
Length: 12.6 cm		
Diameter: 5.3 cm		
		
Sealing string D2cm 350m	**3.8**	**581839000**
Dichtschnur D2cm 350m		
Adhesive tape PVC 50mm 33m	**0.32**	**581841000**
Bauklebeband PVC 50mm 33m		
Sealing tape KS 10x3mm 10m	**0.07**	**581840000**
Sealing tape KS 20x5mm 10m	**0.17**	**580348000**
Dichtungsband KS		
Doka fair-faced concrete start-up gear	**0.78**	**581849000**
Doka Sichtbeton-Startpaket		
		
Doka-Trenn in container of 1000l	**899.0**	**580911000**
Doka-Trenn in drum of 200l	**185.0**	**580912000**
Doka-Trenn in canisters of 25l	**22.0**	**580913000**
Doka-Trenn in canisters of 5l	**4.5**	**580915000**
Doka-Trenn		
Doka-OptiX 1000l	**1011.0**	**580918000**
Doka-OptiX 210l	**215.5**	**580916000**
Doka-OptiX 20l	**20.0**	**580917000**
Doka-OptiX		
Doka sprayer for release agent	**5.3**	**580914000**
Doka-Trennmittel-Spritze		
Follow the directions in the "Operating Instructions"!		
		
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		

	[kg]	Article N°
Doka formwork sheet 3-SO 21mm 100/50cm	**4.9**	**186007000**
Doka formwork sheet 3-SO 21mm 150/50cm	**7.3**	**186008000**
Doka formwork sheet 3-SO 21mm 200/50cm	**9.7**	**186009000**
Doka formwork sheet 3-SO 21mm 250/50cm	**12.1**	**186011000**
Doka formwork sheet 3-SO 21mm 300/50cm	**14.6**	**186012000**
Doka formwork sheet 3-SO 21mm 350/50cm	**17.0**	**186028000**
Doka formwork sheet 3-SO 21mm 400/50cm	**19.4**	**186013000**
Doka formwork sheet 3-SO 21mm 450/50cm	**21.8**	**186029000**
Doka formwork sheet 3-SO 21mm 500/50cm	**24.3**	**186014000**
Doka formwork sheet 3-SO 21mm 550/50cm	**26.7**	**186023000**
Doka formwork sheet 3-SO 21mm 600/50cm	**29.1**	**186027000**
Doka formwork sheet 3-SO 21mm 100/100cm	**9.7**	**186015000**
Doka formwork sheet 3-SO 21mm 150/100cm	**14.6**	**186016000**
Doka formwork sheet 3-SO 21mm 200/100cm	**19.4**	**186017000**
Doka formwork sheet 3-SO 21mm 250/100cm	**24.3**	**186018000**
Doka formwork sheet 3-SO 21mm 300/100cm	**29.1**	**186019000**
Doka formwork sheet 3-SO 21mm 350/100cm	**34.0**	**186030000**
Doka formwork sheet 3-SO 21mm 400/100cm	**38.8**	**186020000**
Doka formwork sheet 3-SO 21mm 450/100cm	**43.7**	**186031000**
Doka formwork sheet 3-SO 21mm 500/100cm	**48.5**	**186021000**
Doka formwork sheet 3-SO 21mm 550/100cm	**53.4**	**186022000**
Doka formwork sheet 3-SO 21mm 600/100cm	**58.2**	**186024000**
Doka formwork sheet 3-SO 21mm 250/125cm	**30.3**	**186097000**
Doka formwork sheet 3-SO 21mm 300/150cm	**43.7**	**186098000**
Doka formwork sheet 3-SO 21mm 600/150cm	**87.3**	**186099000**
Doka formwork sheet 3-SO 21mm 150/50cm BS	**7.3**	**186008100**
Doka formwork sheet 3-SO 21mm 200/50cm BS	**9.7**	**186009100**
Doka formwork sheet 3-SO 21mm 250/50cm BS	**12.1**	**186011100**
Doka formwork sheet 3-SO 21mm 300/50cm BS	**14.6**	**186012100**
Doka formwork sheet 3-SO 21mm		
Doka formwork sheet 3-SO 27mm 100/50cm	**6.1**	**187007000**
Doka formwork sheet 3-SO 27mm 150/50cm	**9.1**	**187008000**
Doka formwork sheet 3-SO 27mm 200/50cm	**12.1**	**187009000**
Doka formwork sheet 3-SO 27mm 250/50cm	**15.1**	**187011000**
Doka formwork sheet 3-SO 27mm 300/50cm	**18.2**	**187012000**
Doka formwork sheet 3-SO 27mm 350/50cm	**21.2**	**187028000**
Doka formwork sheet 3-SO 27mm 400/50cm	**24.2**	**187013000**
Doka formwork sheet 3-SO 27mm 450/50cm	**27.2**	**187029000**
Doka formwork sheet 3-SO 27mm 500/50cm	**30.3**	**187014000**
Doka formwork sheet 3-SO 27mm 550/50cm	**33.3**	**187023000**
Doka formwork sheet 3-SO 27mm 600/50cm	**36.3**	**187027000**
Doka formwork sheet 3-SO 27mm 100/100cm	**12.1**	**187015000**
Doka formwork sheet 3-SO 27mm 150/100cm	**18.2**	**187016000**
Doka formwork sheet 3-SO 27mm 200/100cm	**24.2**	**187017000**
Doka formwork sheet 3-SO 27mm 250/100cm	**30.3**	**187018000**
Doka formwork sheet 3-SO 27mm 300/100cm	**36.3**	**187019000**
Doka formwork sheet 3-SO 27mm 350/100cm	**42.4**	**187030000**
Doka formwork sheet 3-SO 27mm 400/100cm	**48.4**	**187020000**
Doka formwork sheet 3-SO 27mm 450/100cm	**54.5**	**187031000**
Doka formwork sheet 3-SO 27mm 500/100cm	**60.5**	**187021000**
Doka formwork sheet 3-SO 27mm 550/100cm	**66.6**	**187022000**
Doka formwork sheet 3-SO 27mm 600/100cm	**72.6**	**187024000**
Doka formwork sheet 3-SO 27mm 250/125cm	**37.8**	**187106000**
Doka formwork sheet 3-SO 27mm 300/150cm	**54.5**	**187107000**
Doka formwork sheet 3-SO 27mm 600/150cm	**108.9**	**187108000**
Doka formwork sheet 3-SO 27mm 150/50cm BS	**9.1**	**187008100**
Doka formwork sheet 3-SO 27mm 200/50cm BS	**12.1**	**187009100**
Doka formwork sheet 3-SO 27mm 250/50cm BS	**15.1**	**187011100**
Doka formwork sheet 3-SO 27mm 300/50cm BS	**18.2**	**187012100**
Doka-Schalungsplatte 3-SO 27mm		
Formwork sheet 3S top 21 200/40cm	**7.8**	**186185000**
Formwork sheet 3S top 21 250/40cm	**9.7**	**186186000**
Formwork sheet 3S top 21 200/50cm	**9.7**	**186181000**
Formwork sheet 3S top 21 250/50cm	**12.1**	**186182000**
Schalungsplatte 3S top 21		
Formwork sheet 3S top 27 200/40cm	**9.7**	**187185000**
Formwork sheet 3S top 27 250/40cm	**12.1**	**187186000**
Formwork sheet 3S top 27 150/50cm	**9.1**	**187180000**
Formwork sheet 3S top 27 200/50cm	**12.1**	**187181000**
Formwork sheet 3S top 27 250/50cm	**15.1**	**187182000**
Formwork sheet 3S top 27 300/50cm	**18.2**	**187183000**
Formwork sheet 3S top 27 300/100cm	**36.3**	**187184000**
Schalungsplatte 3S top 27		

	[kg]	Article N°
Formwork sheet 3S basic 21 150/50cm	**7.3**	**186211000**
Formwork sheet 3S basic 21 200/50cm	**9.7**	**186212000**
Formwork sheet 3S basic 21 250/50cm	**12.1**	**186213000**
Formwork sheet 3S basic 21 300/50cm	**14.6**	**186214000**
Formwork sheet 3S basic 21 200/100cm	**19.4**	**186215000**
Formwork sheet 3S basic 21 250/100cm	**24.3**	**186216000**
Formwork sheet 3S basic 21 300/100cm	**29.1**	**186217000**
Formwork sheet 3S basic 21 150/50cm BS	**7.3**	**186211100**
Formwork sheet 3S basic 21 200/50cm BS	**9.7**	**186212100**
Formwork sheet 3S basic 21 250/50cm BS	**12.1**	**186213100**
Formwork sheet 3S basic 21 300/50cm BS	**14.6**	**186214100**
Schalungsplatte 3S basic 21		
Formwork sheet 3S basic 27 150/50cm	**9.1**	**187211000**
Formwork sheet 3S basic 27 197/50cm	**11.9**	**187218000**
Formwork sheet 3S basic 27 200/50cm	**12.1**	**187212000**
Formwork sheet 3S basic 27 250/50cm	**15.1**	**187213000**
Formwork sheet 3S basic 27 300/50cm	**18.2**	**187214000**
Formwork sheet 3S basic 27 200/100cm	**24.2**	**187215000**
Formwork sheet 3S basic 27 250/100cm	**30.3**	**187216000**
Formwork sheet 3S basic 27 300/100cm	**36.3**	**187217000**
Formwork sheet 3S basic 27 150/50cm BS	**9.1**	**187211100**
Formwork sheet 3S basic 27 200/50cm BS	**12.1**	**187212100**
Formwork sheet 3S basic 27 250/50cm BS	**15.1**	**187213100**
Formwork sheet 3S basic 27 300/50cm BS	**18.2**	**187214100**
Schalungsplatte 3S basic 27		
Dokaplex formwork sheet 4mm 300/150cm	**11.7**	**185013000**
Dokaplex-Schalungsplatte 4mm 300/150cm		
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 9mm 125/250cm	**19.1**	**185069000**
DokaPly Birch DC 12mm 125/250cm	**25.6**	**185066000**
DokaPly Birch DC 12mm 150/300cm	**36.9**	**185067000**
DokaPly Birch DC 15mm 125/250cm	**31.9**	**185074000**
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 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		
DokaPly Birch SC 9mm 125/250cm	**19.1**	**185129000**
DokaPly Birch SC 12mm 125/250cm	**25.5**	**185130000**
DokaPly Birch SC 15mm 125/250cm	**31.9**	**185099000**
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 21mm 62.5/250cm	**22.6**	**185198000**
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		
Ply Birch BB/CP 18mm 125/250cm	**38.3**	**185146000**
Ply Birch BB/CP 21mm 125/250cm	**44.6**	**185147000**
Ply Birch BB/CP		

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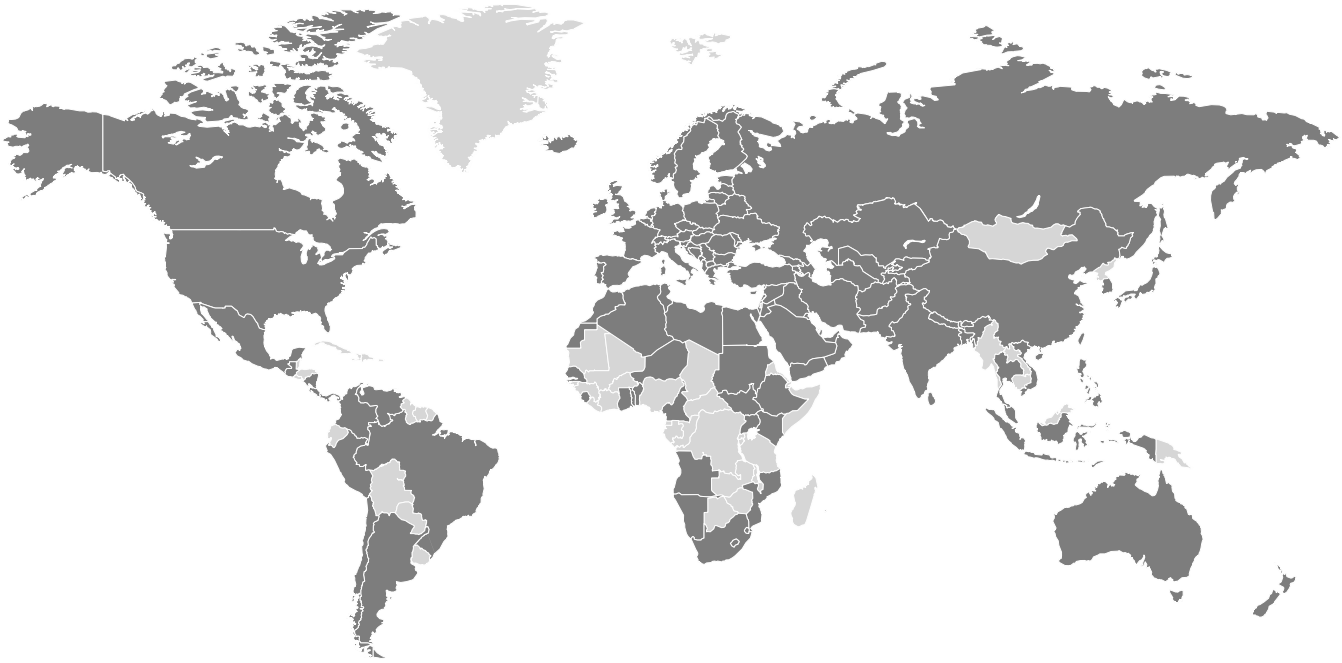

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