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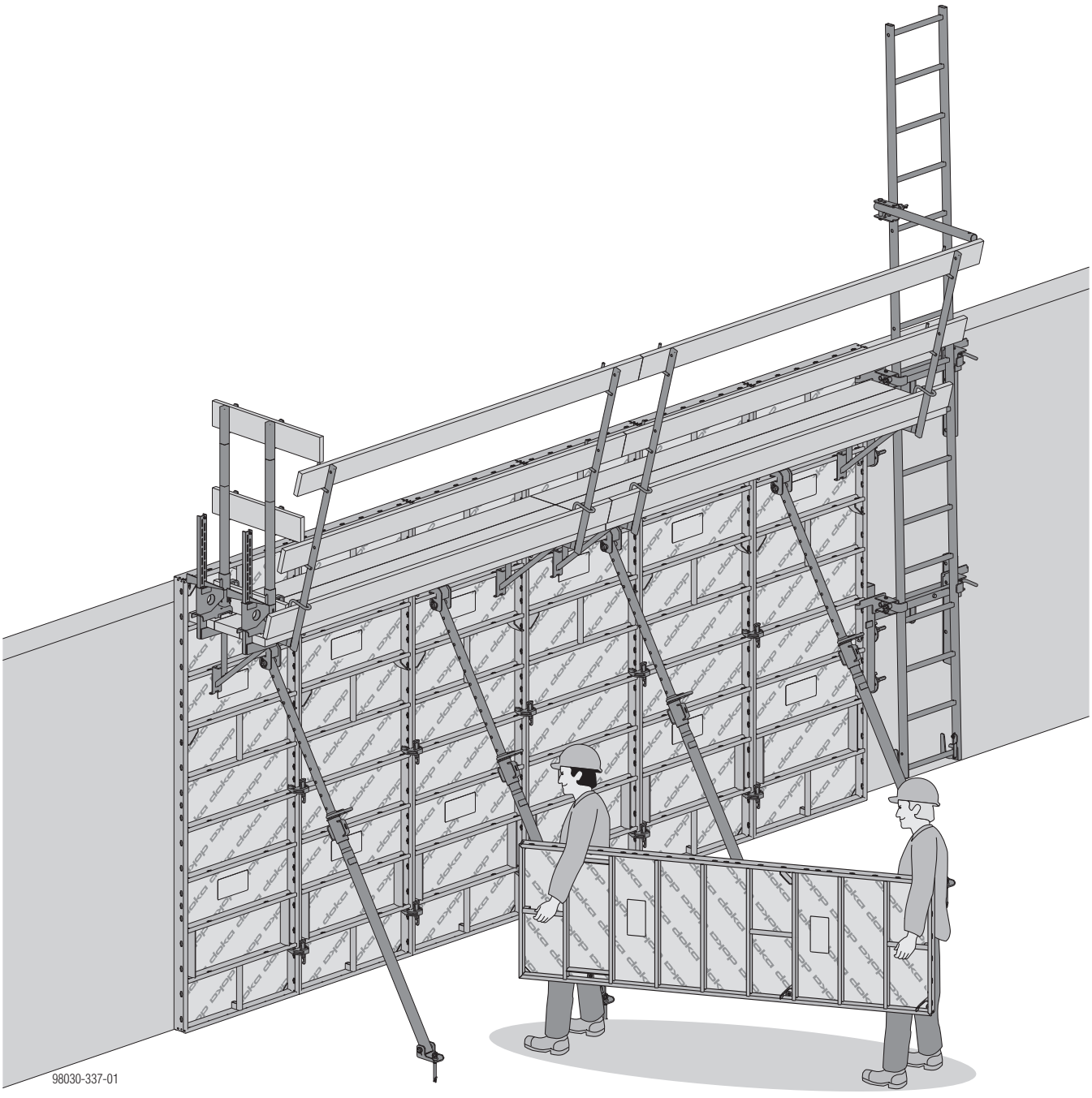
en-GB

The Formwork Experts.

Framed formwork Frami Xlife / Frami eco

User Information

Instructions for assembly and use (Method statement)



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.
- 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.
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this document!

Maintenance

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

Miscellaneous

The weights as stated are averages for new material; actual weights can differ, depending on material tolerances. Dirt accretions, moisture saturation, etc. can also affect weight.
We reserve the right to make alterations in the interests of technical progress.

Eurocodes at Doka

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

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

Allowance has been made for the following partial factors:

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

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

Symbols used

The following symbols are used in this document:

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

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

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

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

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

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

Tip
Points out useful practical tips.

Reference
Cross-references other documents.

Services

Support in every stage of the project

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

Project assistance from start to finish

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

Efficient planning for a safe project sequence

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

Optimise construction workflows with Doka

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

Custom formwork and on-site assembly

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

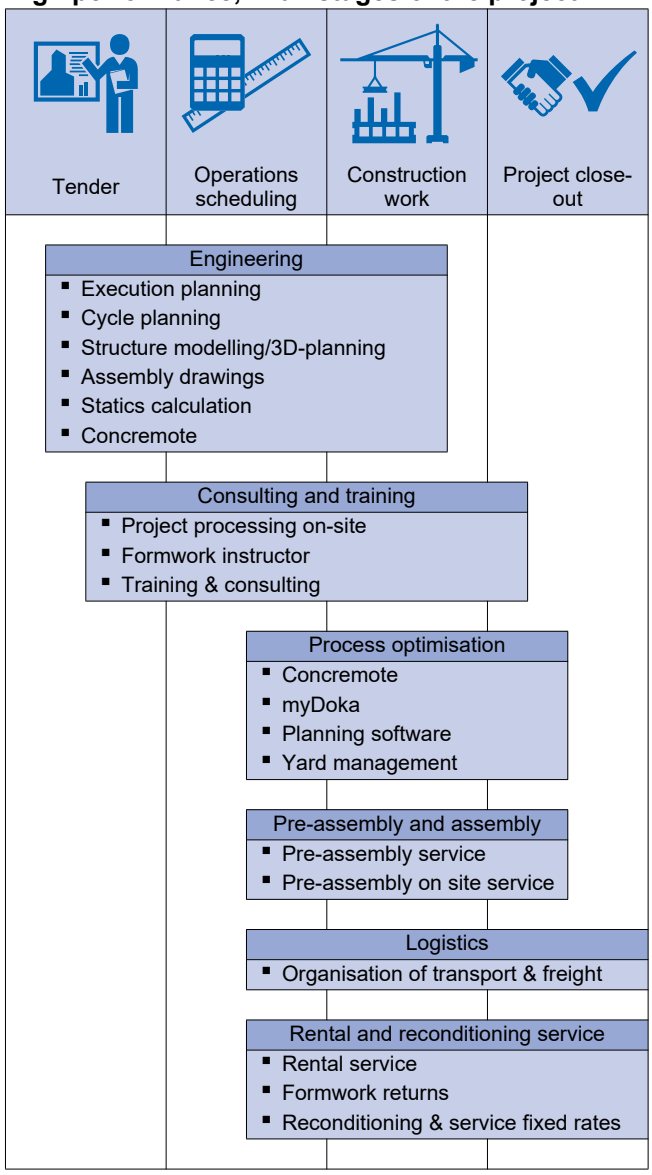
Just-in-time availability

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

Rental and reconditioning service

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

High performance, in all stages of the project



upbeat construction
digital services for higher productivity

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

Framed formwork Frami Xlife

Frami Xlife is ideal for fast, cost-saving forming both with and without a crane.

Saves time, cuts labour costs

with its system logic, ease of cleaning and low form-tie ratio

Frami Xlife has several features that make it extremely cost-efficient:

- its Xlife sheet is easier and quicker to clean
- cost-savings from its low form-tie ratio
- faster repositioning thanks to the clearly defined grid for the shifting units
- shorter forming-times, as the system minimises any filler zones

High economy, maximum lifespan

due to the Xlife sheet and galvanised hollow-section steel frames

The high product quality

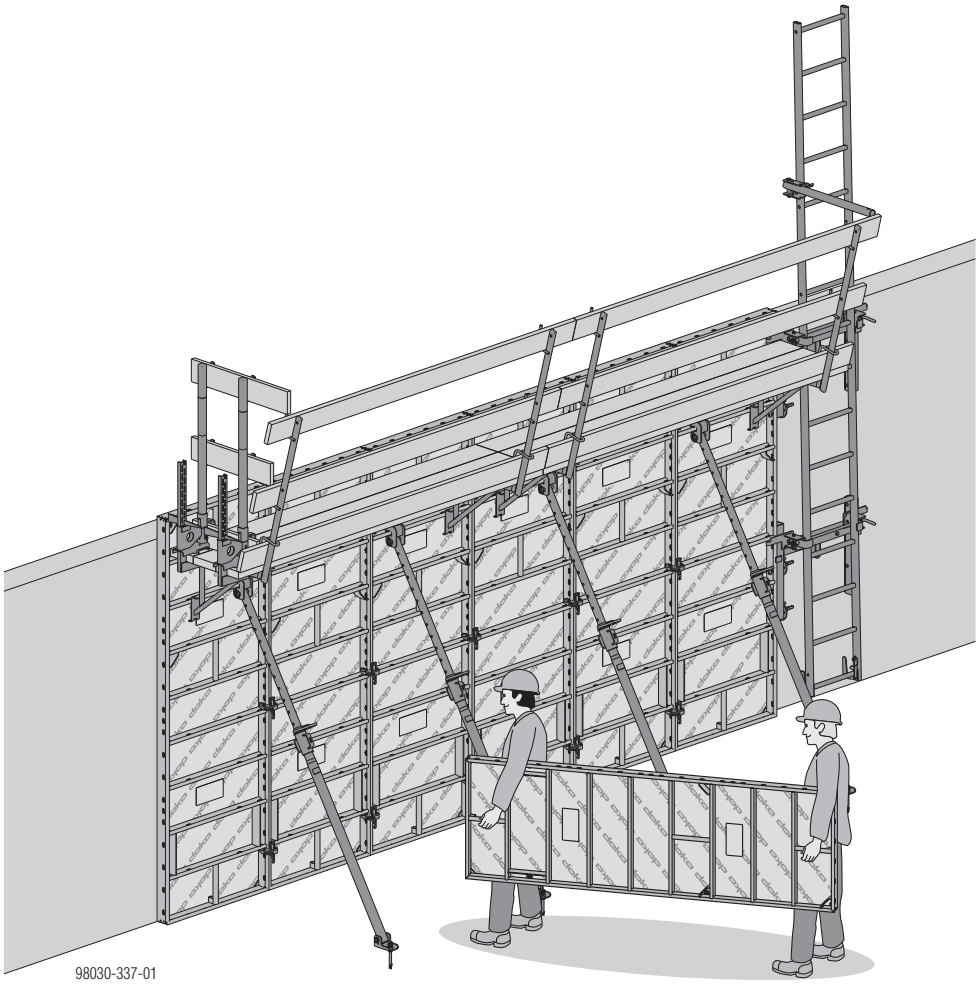
- lowers close-out and rehabilitation costs
- ensures that the formwork system will have a long service life

Simplifies planning and handling

as the system can be used in so many different ways

The ingenious Frami Xlife formwork system gives you

- huge flexibility, because you can combine panel heights from 1.20 m to 3.00 m
- an efficient way of forming shafts, in conjunction with the Framax stripping corner I
- rapid formwork planning using the professional Tipos-Doka software
- cost savings from reduced commissioning quantities



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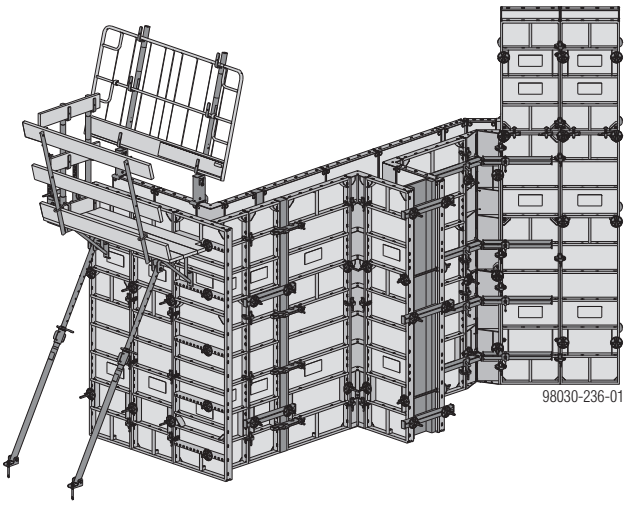
Note:

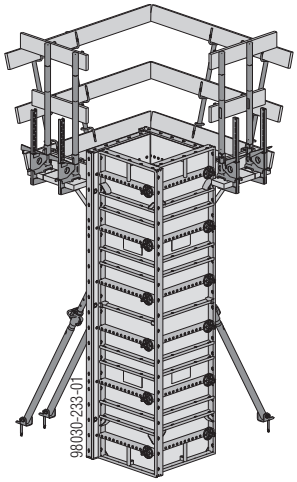
All the **technical data** given in this document apply equally to both **Frami Xlife panels** and **Frami eco panels**.

Areas of use

Wall formwork

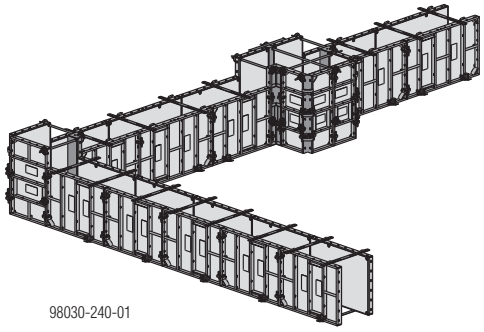


Column formwork



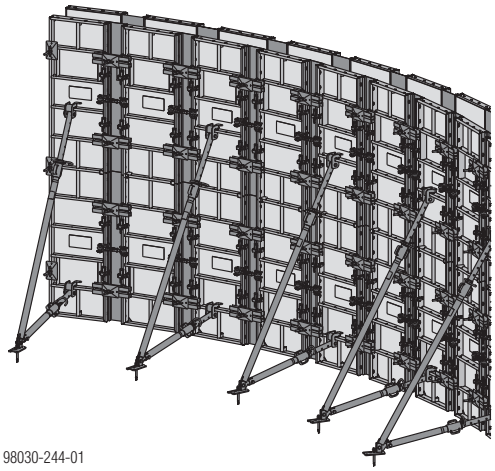
Follow the directions in the 'Column formwork Frami Xlife' User Information booklet!

Foundation formwork



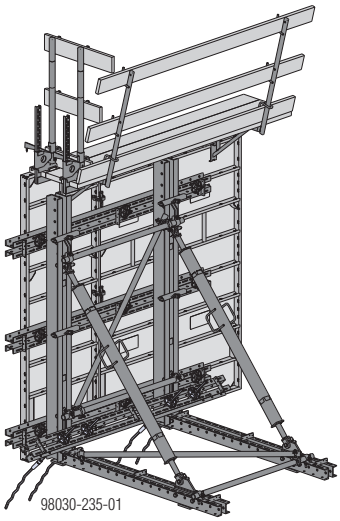
Follow the directions in the 'Foundation formwork Frami Xlife' User Information booklet!

Circular formwork

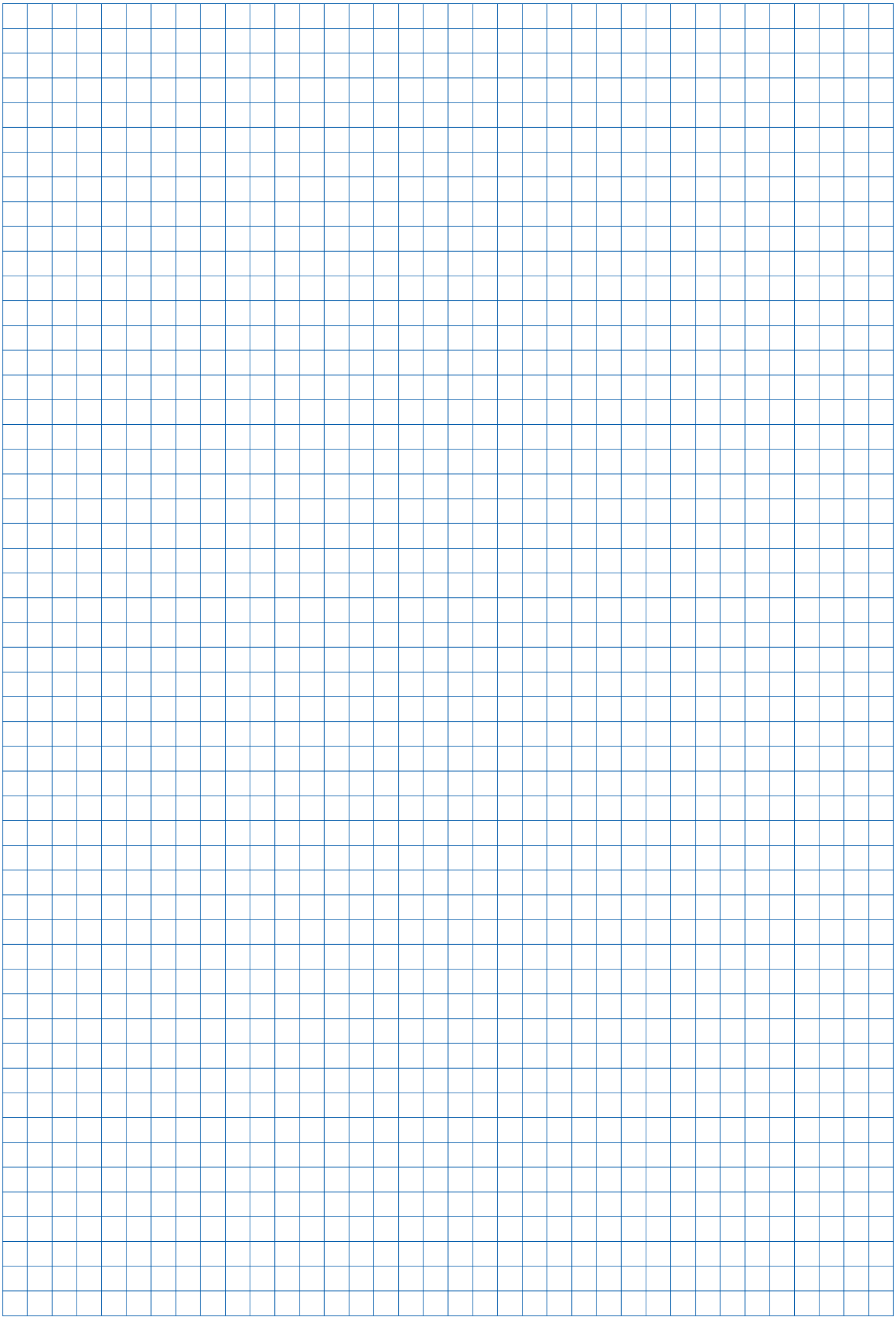


Follow the directions in the 'Circular formwork Frami Xlife' User Information booklet!

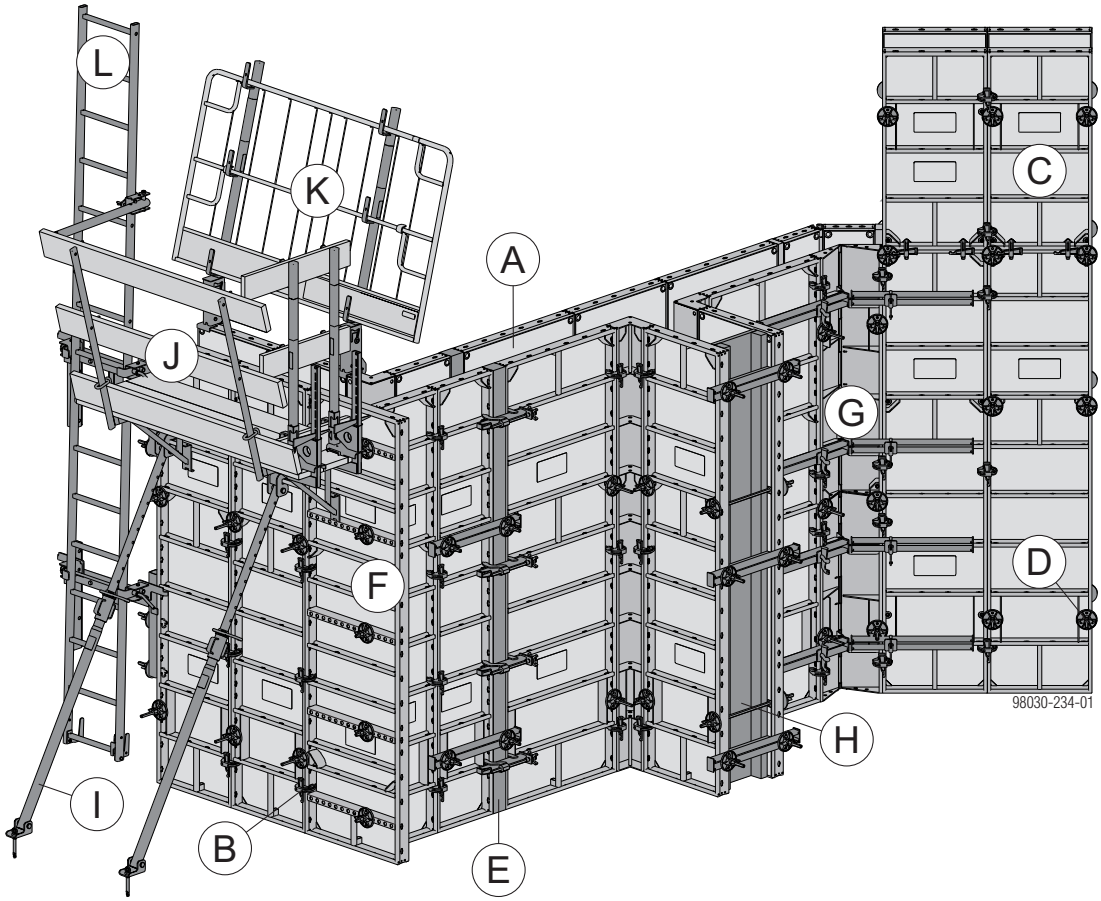
Single-sided formwork



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



Wall formwork



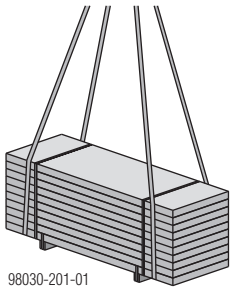
Instructions for assembly and use (Method statement)

Frami Xlife as a hand-set formwork

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

Transporting / handling the panels

➤ For offloading panels from a truck, or lifting them on-site a stack at a time, use the Dokamatic lifting strap 13.00m (see 'Transporting, stacking and storing').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Closing the formwork

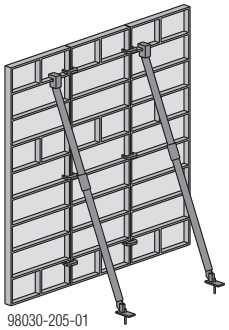
➤ Spray the formwork sheet with release agent (see 'Cleaning and care of your equipment').

WARNING
➤ Frami Xlife panels must be securely braced in every phase of the construction work!

➤ Fix the first panel to the ground with a panel strut (see the section headed 'Plumbing accessories'). This stabilises the panel so that it cannot fall over.

CAUTION
Never use a sledge hammer to plumb the panels!
This would damage the profiles of the panels.
➤ Use only proper plumbing tools (e.g. a special pry-bar) that cannot cause any damage!

➤ Continue lining up panels in this way, clamp them together (see 'Inter-panel connections') and attach panel struts.
The panel assembly can now be exactly plumbed and aligned.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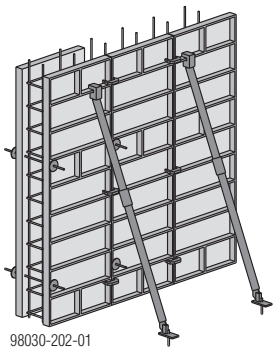
Erecting the opposing formwork:

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

➤ Spray the formwork sheet of the opposing formwork with release agent.
➤ Stand up the first panel of the opposing formwork.
➤ Fit the form ties (see 'Tie-rod system').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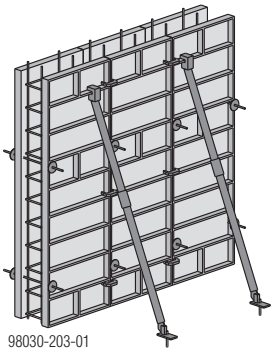
Now the opposing formwork is also secured against tipping over.

➤ In the same way, carry on lining up panels, clamping them together and fitting form ties.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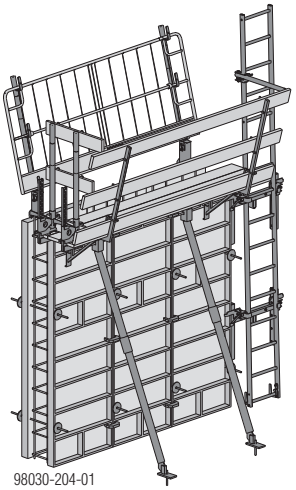
Mounting the pouring platform and ladderway

➤ Mount the pouring platform and attach end-of-platform sideguards where necessary (see 'Pouring platforms with single brackets').
➤ Mount the Ladder system XS (see 'Ladder system').



NOTICE

Multi-panel gangs without an opposing formwork and with pouring platforms and Plumbing struts 260 must be fixed on the ground so that they cannot be dislodged.

Pouring

Permitted pressure of the fresh concrete:
See the section headed 'Permissible fresh-concrete pressure'.

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

NOTICE

➤ Do not exceed the maximum permissible rate of placing.

➤ Pour the concrete.
➤ Make only moderate use of vibrators, carefully coordinating the times and locations of vibrator use.

Stripping the formwork

NOTICE

➤ Comply with the stipulated stripping times.

➤ Beginning with the opposing formwork, dismount the panels one by one - take out the form ties and remove the connectors to the neighbouring panel.
➤ Lift the panel away and clean concrete residue off the formwork sheet (see the section headed 'Cleaning and care of your equipment').

Frami Xlife as a crane-handled formwork

Large gang-forms can be pre-assembled face-down on a prepared flat area. For detailed instructions on installing the connectors, see the section headed 'Vertical stacking of panels'.

These gangs can be lifted and reset with lifting chains and Frami lifting hooks. For detailed instructions on this, see the section headed 'Lifting by crane'.

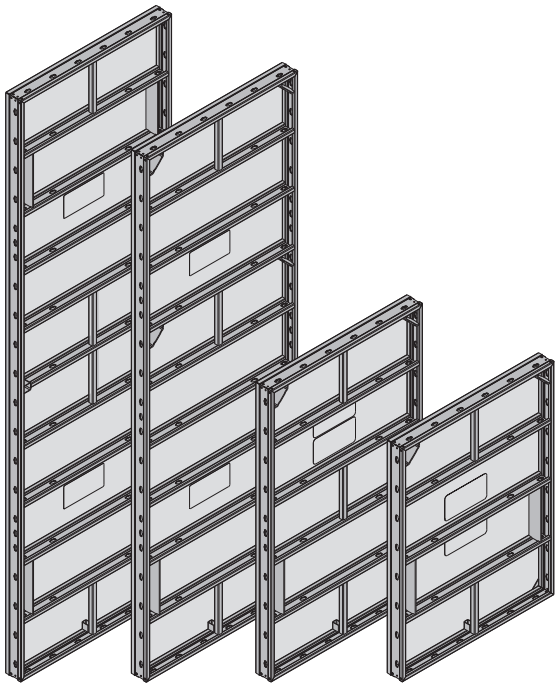
Max. load:
- Spread angle β up to 30°:
  500 kg (1100 lbs) / Frami lifting hook
- Spread angle β up to 7.5°:
  750 kg (1650 lbs) / Frami lifting hook

Frami lifting hooks with load-bearing capacity of 500 kg (1100 lbs) max. also meet the requirements for a load-bearing capacity of 750 kg (1650 lbs) max. using a spread angle β of ≤ 7.5°.

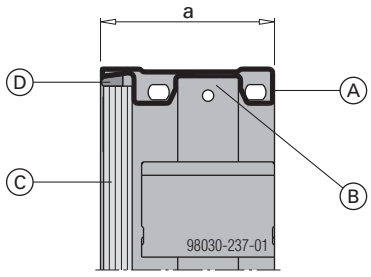
The Frami panel in detail

Frami Xlife panels

High load-bearing capacity



Dimensionally stable steel frame made of hollow profiles



a ... 92 mm

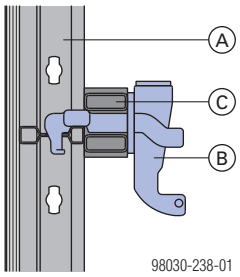
A Frame profile
B Continuous hardware slot for inter-panel connectors
C Xlife sheet
D Silicone sealing strip

- Dimensionally stable frame profiles
- Hot-dip galvanised for long life
- Strong cross-profiles
- Edges are easy to clean - so panels always abut tightly
- All-round hardware slot for fastening the inter-panel connectors at any point required
- Xlife sheet edge-protected by frame profile
- Cross boreholes for corner configurations and stop-ends

WARNING

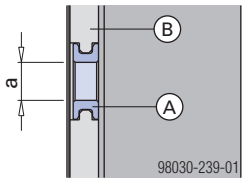
➤ It is forbidden to climb on the cross-profiles. The cross-profiles are NOT a substitute for a ladder.

Accessories are easy to fasten in the cross profile



A Frami Xlife panel
B Frami wedge clamp
C Frami universal waling

Form-tie hole



a ... diam. 20 mm

A Form-tie protector
B Xlife sheet

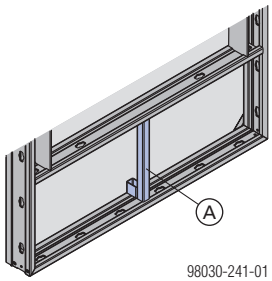
- Xlife sheet protected around the tie-holes by integrated form-tie protectors

Clean concrete surfaces with the innovative Xlife sheet

The Xlife sheet consists of a **combination of a traditional plywood core and a plastic coating**.
This combination of materials ensures high numbers of repeat uses, with superb concrete results every time, and reduces the proneness to damage.

- High quality concrete finish
- Less touching-up needed
- Less cleaning work - the Xlife sheet can also be cleaned using a high-pressure spray cleaner

Handles



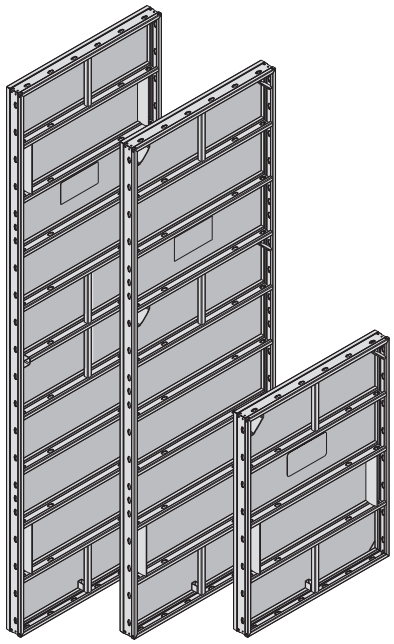
A Integral handle

WARNING
Do not use these handles as slinging points for crane-handling!

Danger of formwork dropping from crane!

➤ Use only suitable load-carrying equipment and slinging points. See 'Lifting by crane' and 'Transporting, stacking and storing'.

Frami eco panels



Differences from Frami Xlife panels:

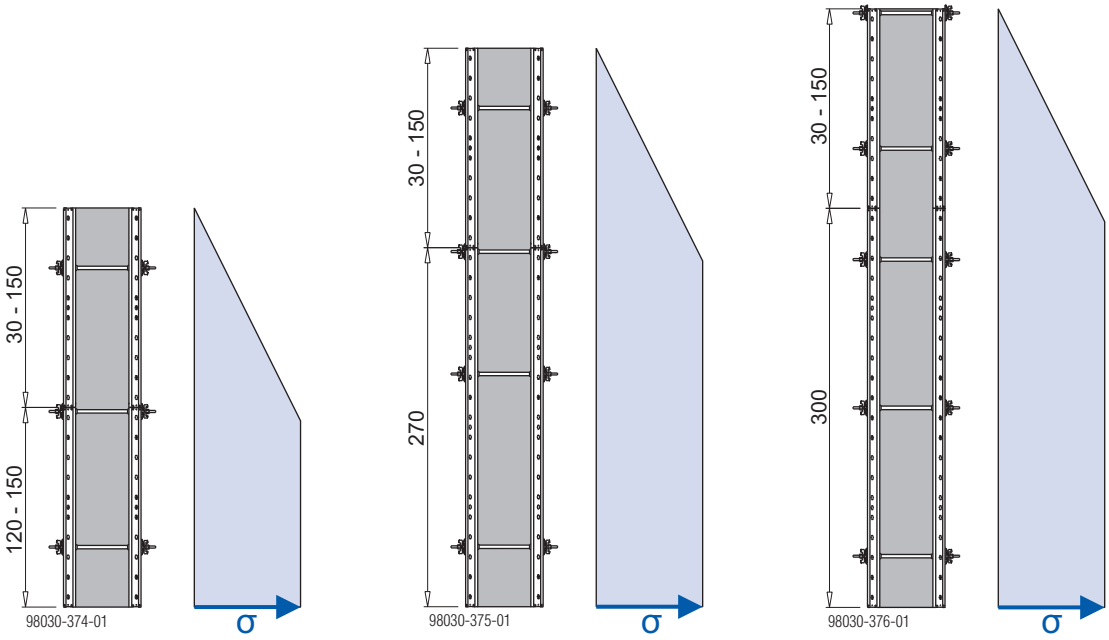
- powder-coated steel frames
- high-quality 15 mm thick film-coated formwork sheet

Permissible fresh-concrete pressure

Permitted fresh-concrete pressure as defined by DIN 18218, and subject to compliance with the surface planeness tolerances specified in DIN 18202 Table 3 Line 6:

$\sigma_{hk,\ max}$ = 40 kN/m²

Permitted fresh-concrete pressure σ_{hk} on **vertically stacked formwork**: 40 kN/m²



Permitted fresh-concrete pressure, as a function of the maximum panel width

(only applies when using the approved Frami panels as per the table).

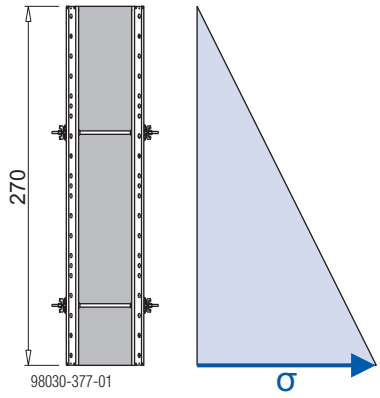
	Max. panel width	Permitted fresh-concrete pressure $\sigma_{hk,\ max}$			
		40 kN/m²	**50 kN/m²**	**60 kN/m²**	**70 kN/m²**
Frami Xlife panel (all panel heights)	0.90m	✓			
	0.75m	✓	✓		
	0.60m	✓	✓	✓	
	0.45m	✓	✓	✓	✓
	0.30m	✓	✓	✓	✓
Frami Xlife universal panel (all panel heights)	0.90m	✓			
	0.75m	✓	✓		

i.e.: For an increased fresh-concrete pressure of up to **60 kN/m²**, only panels with a width of 0.60m, 0.45m and 0.30m are allowed to be used.
For an increased fresh-concrete pressure of up to **70 kN/m²**, only panels with a width of 0.45m and 0.30m are allowed to be used.

Note:
All other Frami accessories are loadable with an increased fresh-concrete pressure of up to 70 kN/m²

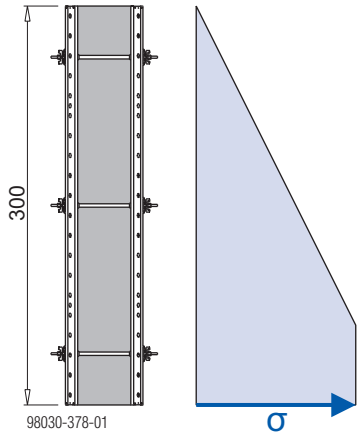
$\sigma_{hk, max, hydr}$ = 67.5 kN/m²

Frami Xlife panels 2.70m are hydrostatically loadable up to a **pour height of 2.70 m** (σ_{hk} = 67.5 kN/m²).



$\sigma_{hk, max}$ = 60 kN/m²

Frami Xlife panels 3.00m are loadable up to a **pour height of 3.00 m** with a permitted fresh-concrete pressure σ_{hk} of 60 kN/m².

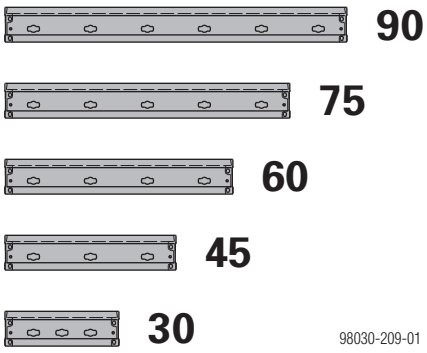


System grid

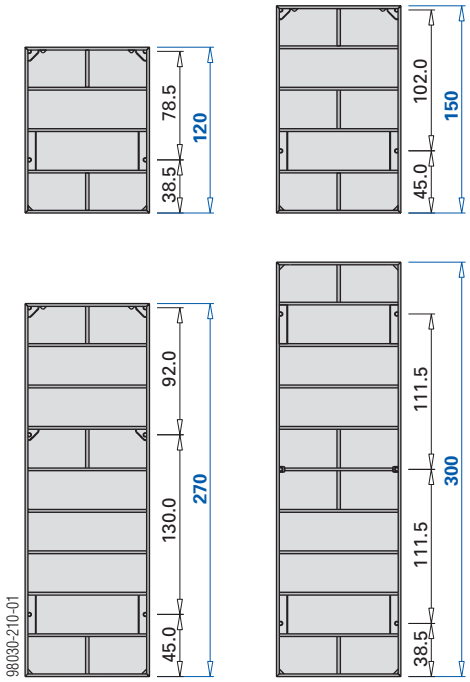
Frami Xlife panels

The widths and heights of the Frami Xlife panels result in a logical **15 cm increment-grid**.

Panel widths

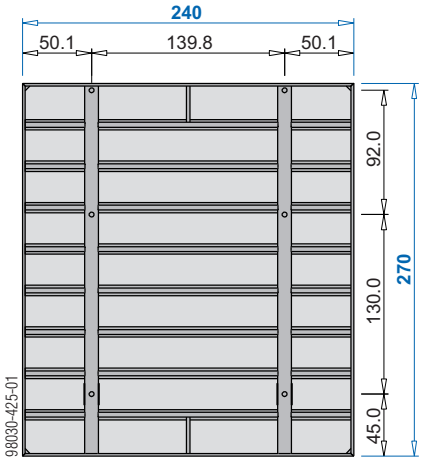


Panel heights



Dimensions in cm

Extra-large panel



Dimensions in cm

For some typical practical examples, see the section headed 'Vertical stacking of panels'.

Frami eco panels

The available dimensions are listed in the 'Product overview' section.

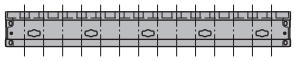
Frami Xlife universal panels

The special hole pattern makes these panels particularly suitable for efficient forming of:

- corners
- wall junctions
- stop-ends
- columns

Frami Xlife universal panel 0.75m

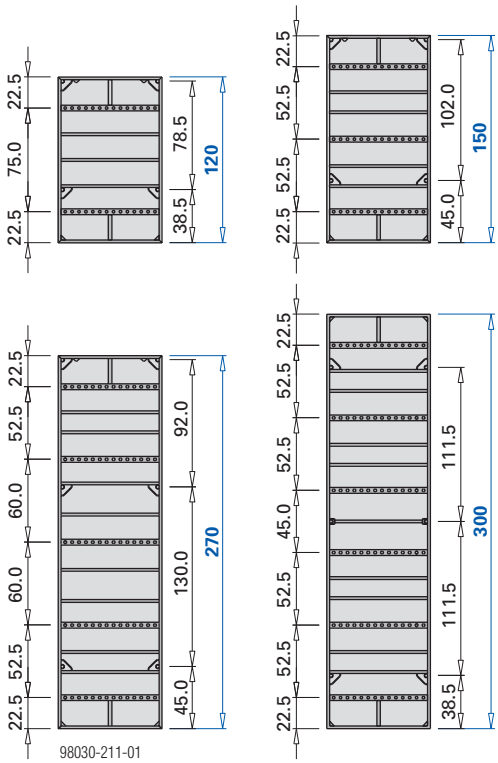
Panel width



75

98030-213-01

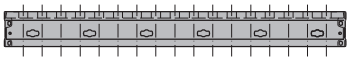
Panel heights



Dimensions in cm

Frami Xlife universal panel 0.90m

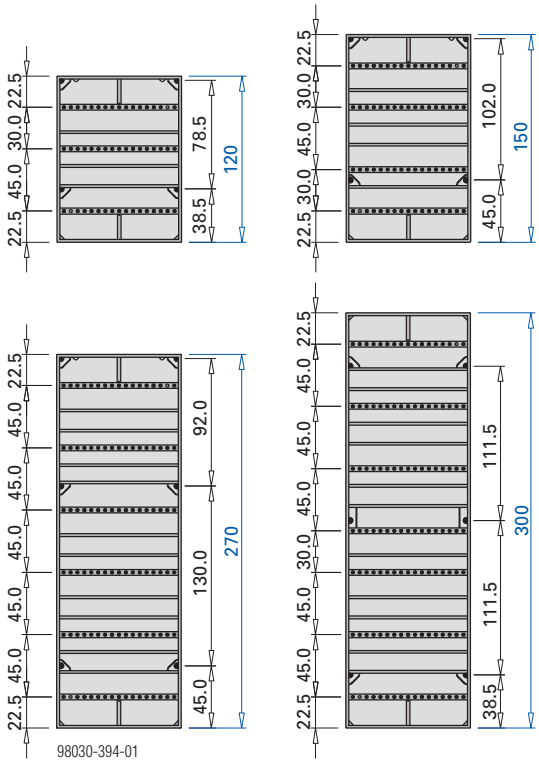
Panel width



90

98030-394-02

Panel heights

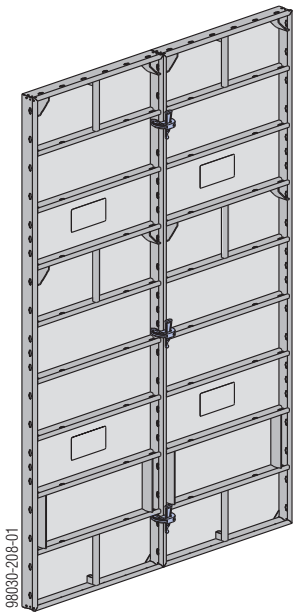


Dimensions in cm

Frami eco universal panels

The available dimensions are listed in the 'Product overview' section.

Inter-panel connections



Shown here on Frami Xlife panels 2.70m.

Attributes of the panel connectors:

- provide self-aligning, crane-handling-safe connections between the panels
- no losable small parts
- dirt-resistant and hard-wearing for site use
- easy to fix, with a formwork hammer

NOTICE

- Use a formwork hammer weighing max. 800 g.
- Do not oil or grease wedge-clamped joints.

Required number of clamps (longitudinal joins):

Panel height (**upright panels**)	Number of clamps
1.20 m	2
1.50 m	2
2.70 m	3
3.00 m	3

Panel width (**horizontal panels**)	Number of clamps
0.30 m	1
0.45 m	1
0.60 m	2
0.75 m	2
0.90 m	2

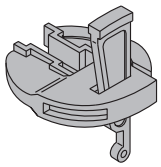
Note:

- For details regarding extra inter-panel connections for outside corners and stop-end formwork (for increased tensile loads) see 'Inter-panel connections for increased tensile loads'.
- For details on the position of the connector components needed in vertical stacking, see 'Vertical stacking of panels'.

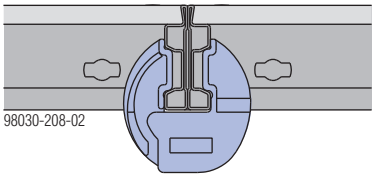
Simple inter-panel connections

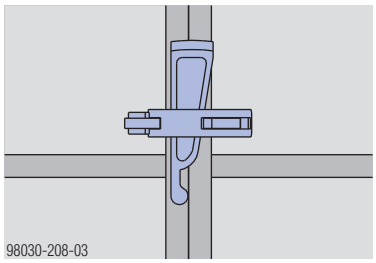
with the Frami clamp

The continuous hardware slot running around the inside of the Frami profile means that the Frami clamp can be fastened at any point desired. This allows adjacent panels to be staggered in height, steplessly.



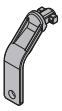
Frami clamp:
Permitted tensile force: 10.0 kN
Permitted shear force: 5.0 kN
Permitted moment: 0.2 kNm

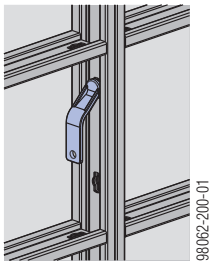




with the Frami clip

It is also possible to use Frami clips instead of Frami clamps. The Frami clips are placed through the cross boreholes in the Frami profiles to connect the panels.





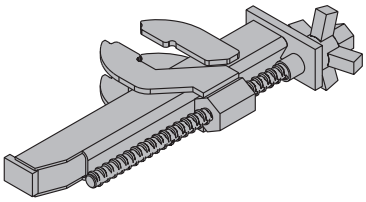
Frami clip:
Permitted tensile force: 10.0 kN
Permitted shear force: 5.0 kN
Permitted moment: 0.2 kNm

Number and position of Frami clips:
Same as for Frami clamps.

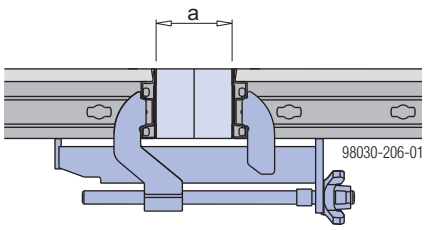
Self-aligning inter-panel connections and closures

with the Frami adjustable clamp

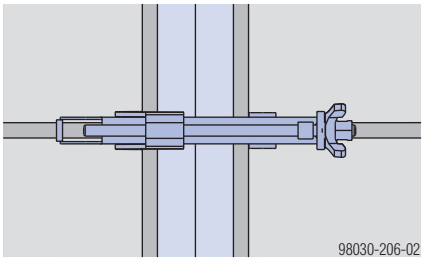
Closures can be bridged easily and economically with Frami fitting timbers. With the Frami adjustable clamp, the panels are joined so that they are resistant to tensile forces, and are aligned at the same time. The adjustable clamp is placed directly over the cross profile.



Frami adjustable clamp:
Permitted tensile force: 7.5 kN



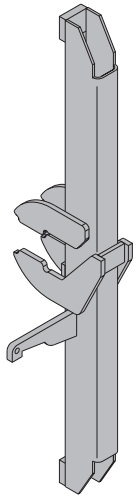
a ... max. 15 cm



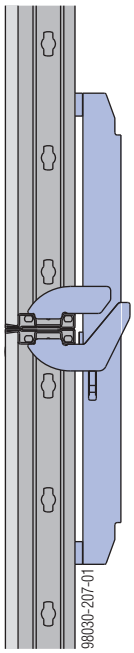
Stiffening inter-panel connections

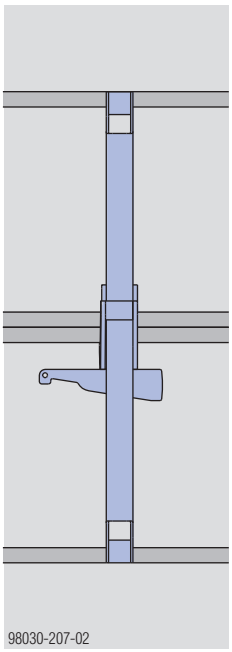
with the Frami aligning clamp

Joining the panels using the Frami aligning clamp provides additional bracing of the multi-panel gang. The aligning clamp is placed directly over the cross profile.



Frami aligning clamp:
Permitted tensile force: 10.0 kN
Permitted moment: 0.45 kNm





Vertical stacking of panels

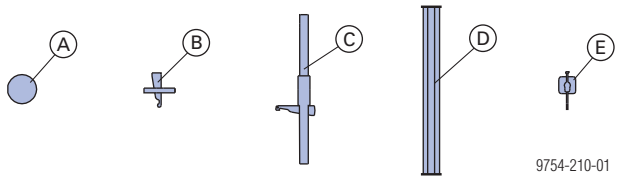
Positions of the interconnecting and form-tie components and accessories needed for:

- Lifting and setting down
- Crane-handling
- Pouring platform
- Casting the concrete
- Wind loads

Frami clamp:
Permitted tensile force: 10.0 kN
Permitted shear force: 5.0 kN
Permitted moment: 0.2 kNm

Frami aligning clamp:
Permitted tensile force: 10.0 kN
Permitted moment: 0.45 kNm

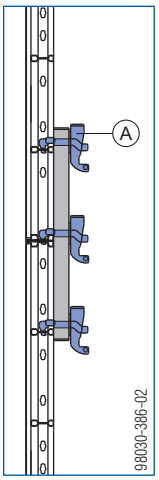
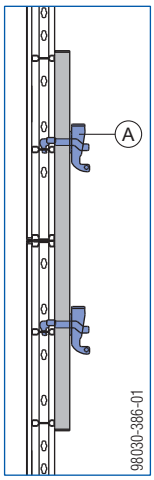
Frami universal waling:
Permitted moment: 1.3 kNm



A	Tie-rod 15.0mm + Super-plate 15.0
B	Frami clamp
C	Frami aligning clamp
D	Frami universal waling 0.70m or 1.25m
E	Frami wedge clamp

NOTICE
Do not oil or grease wedge-clamped joints.

Fixing universal walings to the panel joint

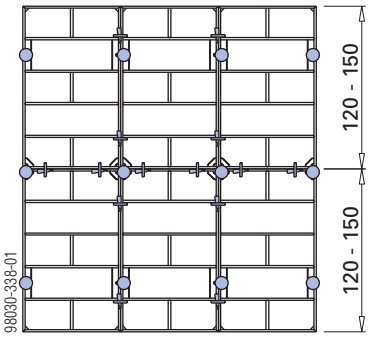
Frami universal waling **0.70m**	Frami universal waling **1.25m**
	
Number of fixing points: **3**	Number of fixing points: **2**

A Frami wedge clamp
or
Frami universal fixing bolt 5-12 cm + Super-plate 15.0

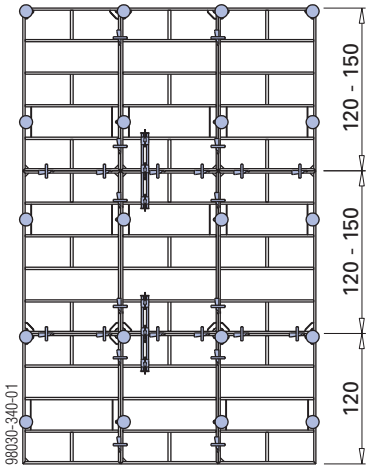
Frami Xlife panel 1.20m and 1.50m

with the Frami clamp

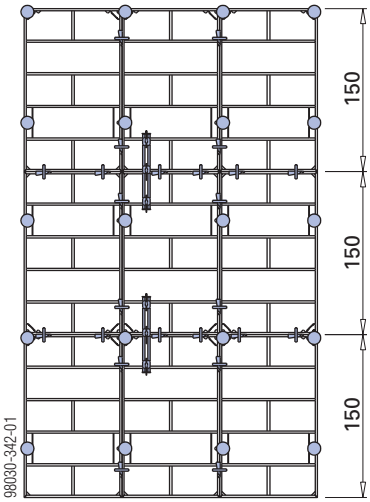
Formwork height: 240, 270 and 300 cm



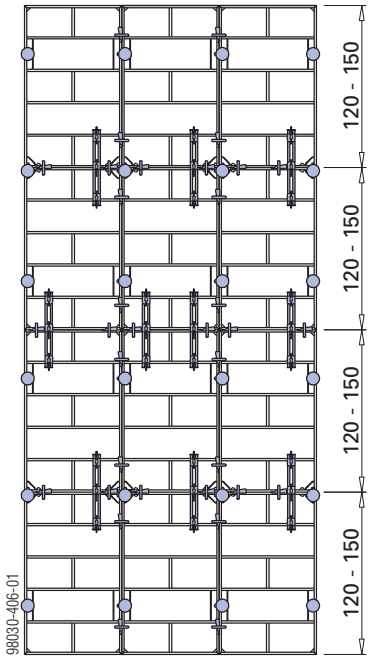
Formwork height: 360, 390 and 420 cm



Formwork height: 450 cm

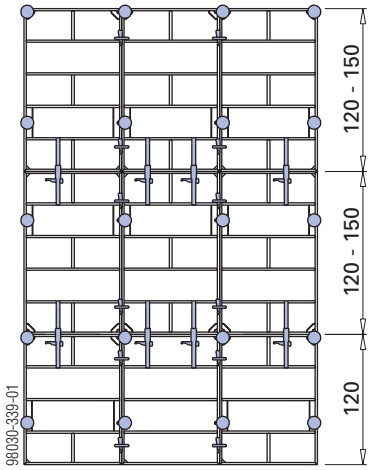


Formwork height: 480, 510, 540, 570 and 600 cm

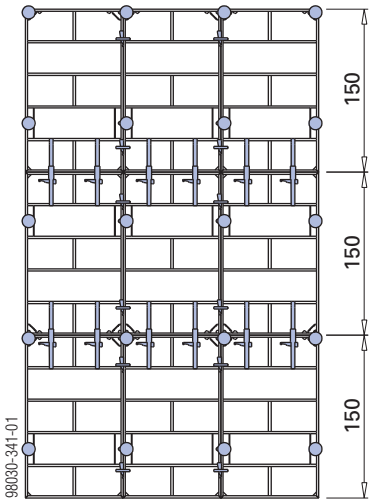


with the Frami aligning clamp

Formwork height: 360, 390 and 420 cm



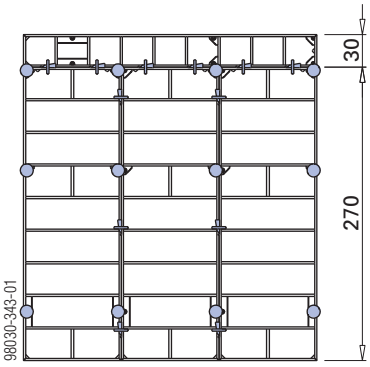
Formwork height: 450 cm



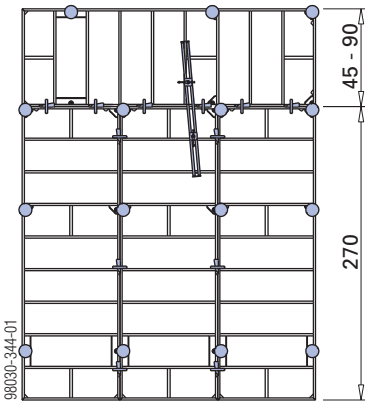
Frami Xlife panel 2.70m

with the Frami clamp

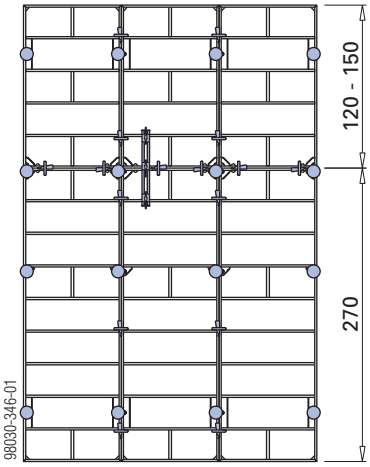
Formwork height: 300 cm



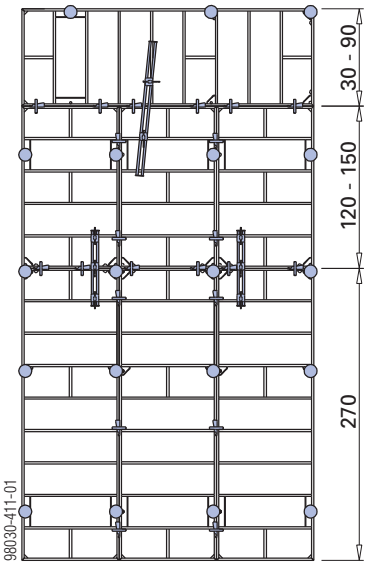
Formwork height: 315, 330, 345 and 360 cm



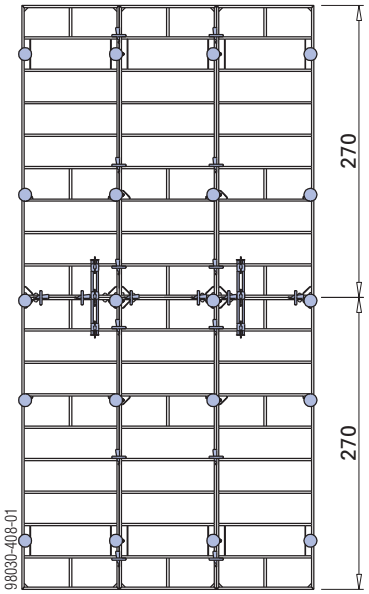
Formwork height: 390 and 420 cm



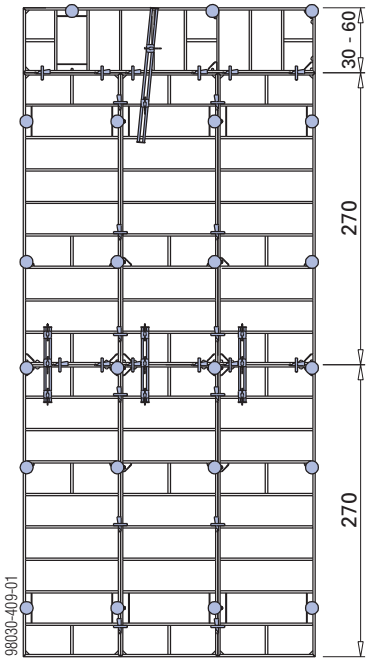
Formwork height: 420, 435, 450, 465, 480, 495 and 510 cm



Formwork height: 540 cm

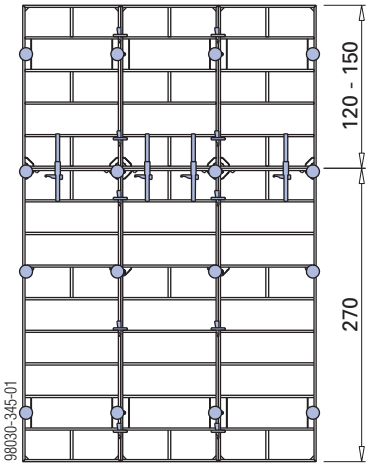


Formwork height: 570 and 600 cm



with the Frami aligning clamp

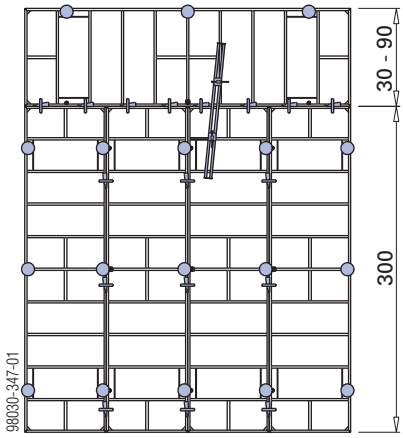
Formwork height: 390 and 420 cm



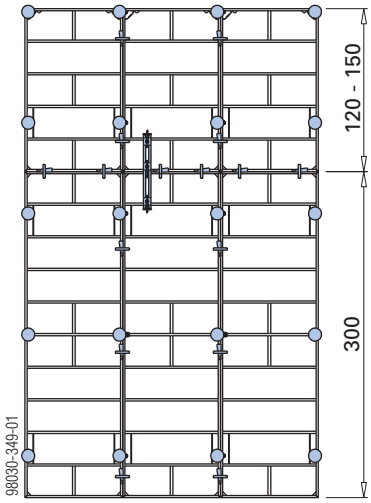
Frami Xlife panel 3.00m

with the Frami clamp

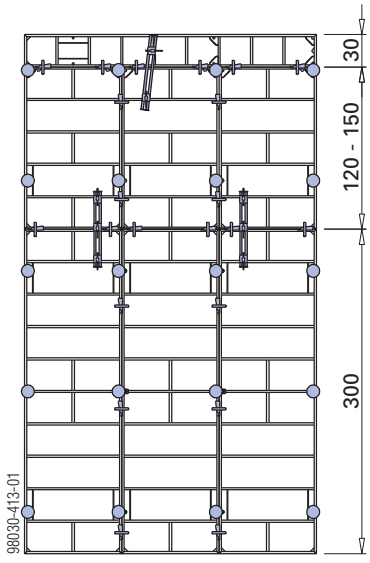
Formwork height: 330, 345, 360, 375 and 390 cm



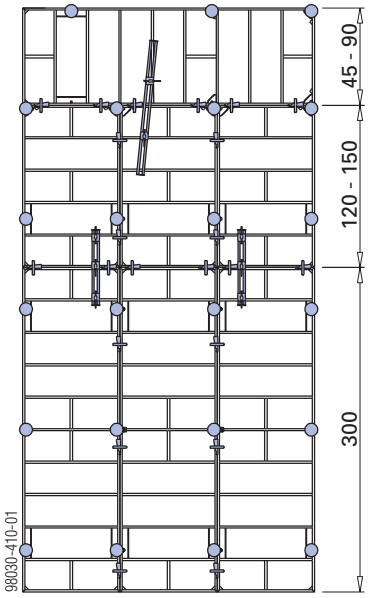
Formwork height: 420 and 450 cm



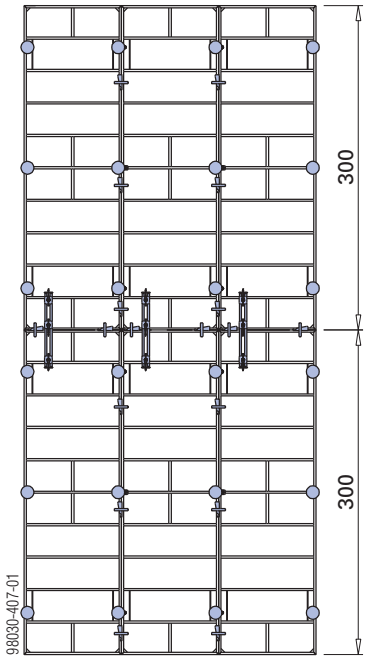
Formwork height: 450 and 480 cm



Formwork height: 465, 480, 495, 510 and 540 cm

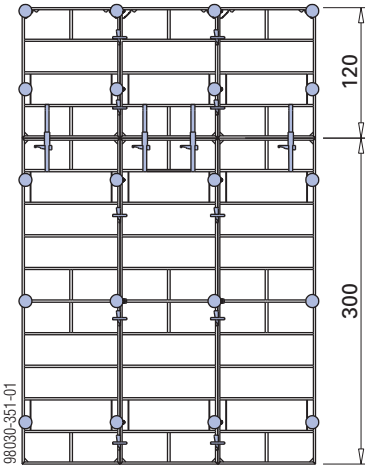


Formwork height: 600 cm

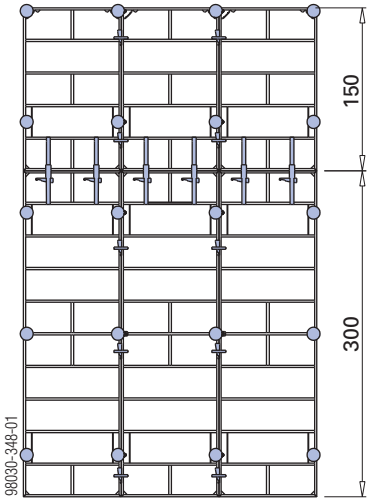


with the Frami aligning clamp

Formwork height: 420 cm



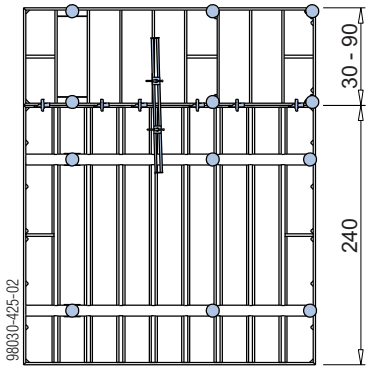
Formwork height 450 cm



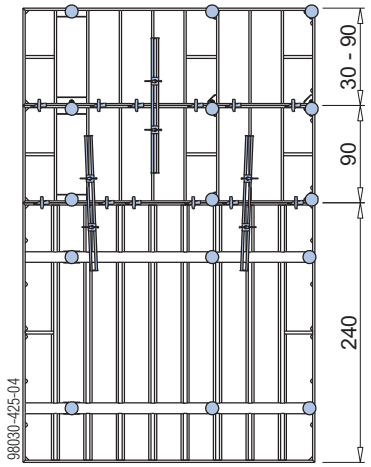
Frami Xlife panel 2.40x2.70m

with the Frami clamp

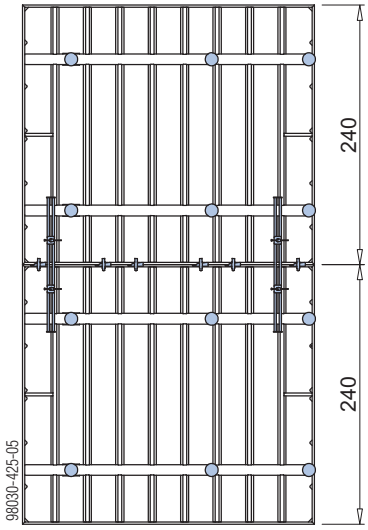
Formwork height: 270, 285, 300, 315 and 330 cm



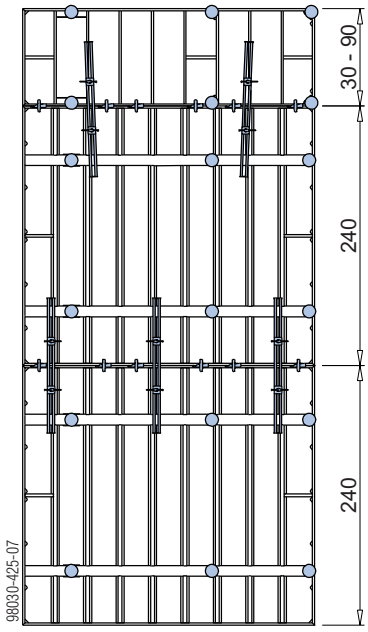
Formwork height: 360, 375, 390, 405 and 420 cm



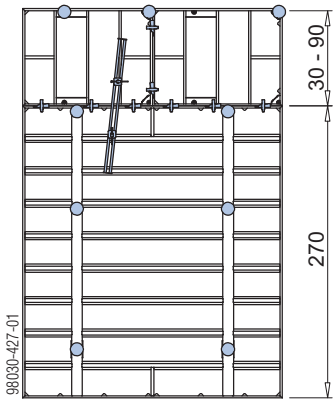
Formwork height: 480 cm



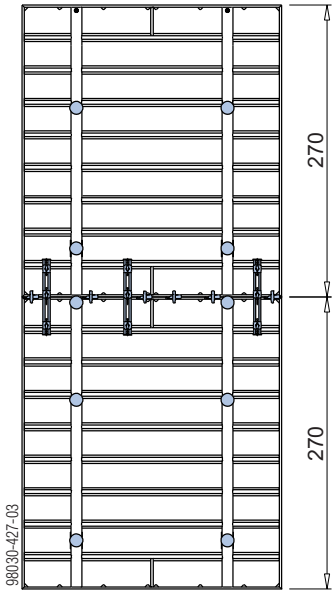
Formwork height: 510, 525, 540, 555 and 570 cm



Formwork height: 300, 315, 330, 345 and 360 cm

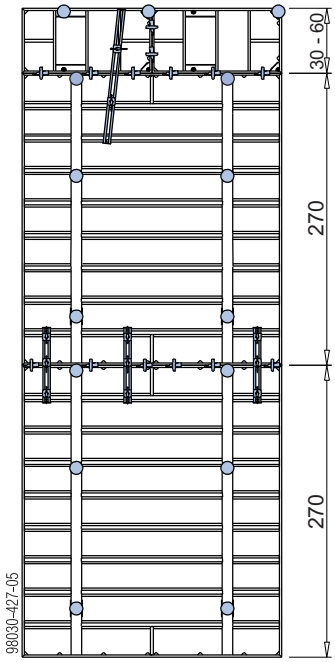


Formwork height: 540 cm



The Frami Xlife-panel 2.40x2.70m must not be used upside down when panels are vertically stacked!

Formwork height: 570, 585 and 600 cm



The Frami Xlife-panel 2.40x2.70m must not be used upside down when panels are vertically stacked!

Tie rod system

Tying the Frami Xlife panels

Basic rule:

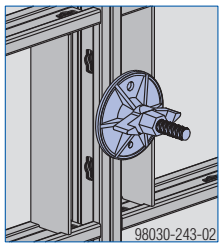
Place a form-tie at every form-tie point that is not covered by an anchor-plate.

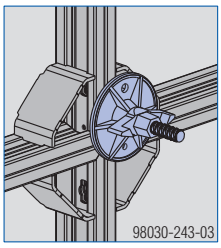
Always tie in the bigger (wider) of the two panels.

For exceptions, see the sections headed 'Length adjustment using closures' and 'Vertical stacking of panels'.

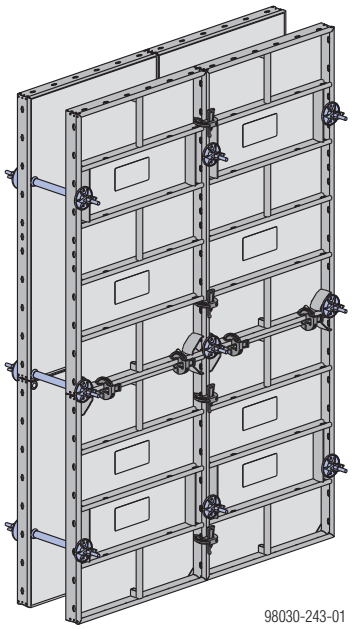
WARNING
Sensitive rod steel!
- ➤ Never weld or heat tie rods.
- ➤ Tie rods that are damaged or have been weakened by corrosion or wear must be withdrawn from use.

Note:
Close off any unneeded tie-holes with Frami frame-hole plugs.



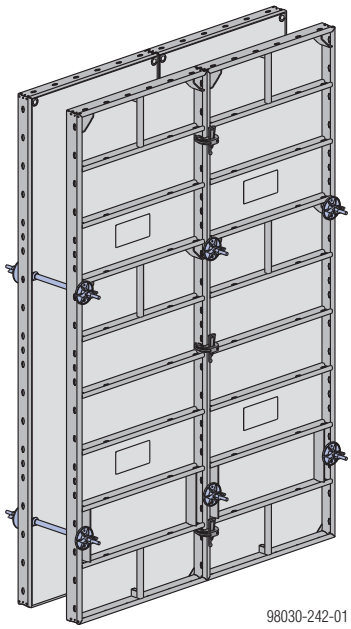


Frami Xlife panel 1.20 + 1.50m

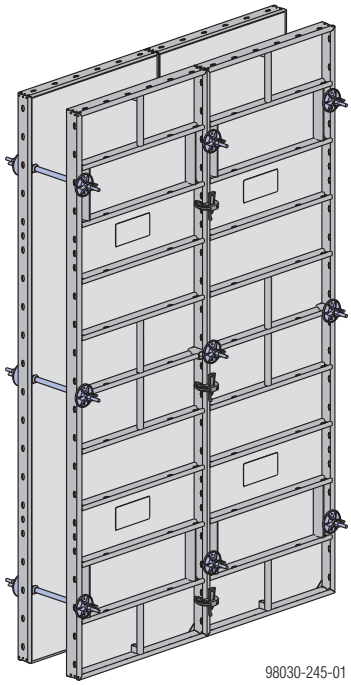


Frami Xlife panel 2.70m

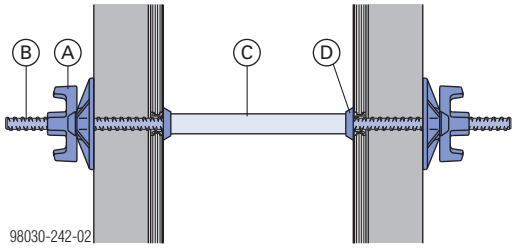
Up to a **pour-height** of **2.70 m** (on unstacked panels) **only 2 form-ties** are needed in the vertical in the Frami Xlife panel 2.70m.



Frami Xlife panel 3.00m



The Doka tie rod system 15.0



A Super-plate 15.0
B Tie-rod 15.0mm
C Plastic tube 22mm
D Universal cone 22mm

Tie rod wrench 15.0/20.0
For turning and holding the tie rods.

The friction-type ratchet SW27 or Box spanner 27 0.65m can be used for **low-noise releasing and tightening** of the following anchoring components:
- Super plates 15.0
- Wing nuts 15.0
- Star grip nuts 15.0

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

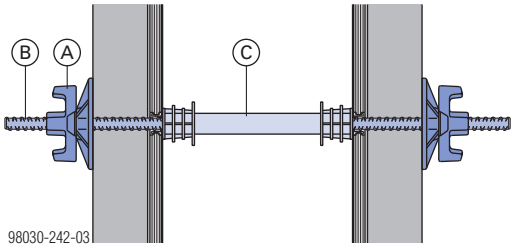
Note:
Doka also offer economical solutions for making watertight form-tie points.

For more information, see the User Information booklet 'Doka form-ties for special requirements'.

Tie rod 15.0mm:
Permitted capacity, allowing a 1.6 : 1 factor of safety against failure: 120 kN
Permitted capacity to DIN 18216: 90 kN

Distance piece

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

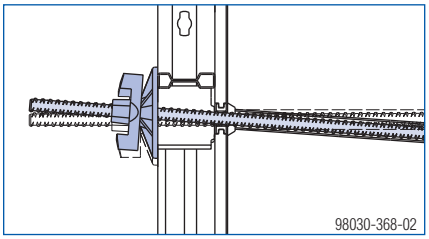


A Super-plate 15.0
B Tie-rod 15.0mm
C Distance piece (ready for use for certain wall thicknesses)

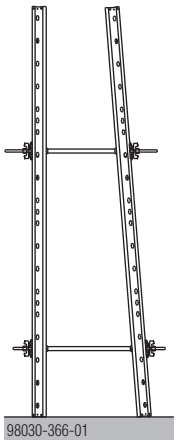
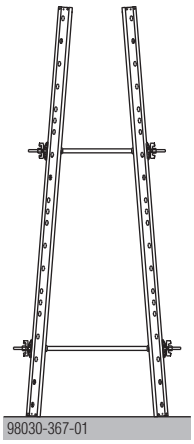
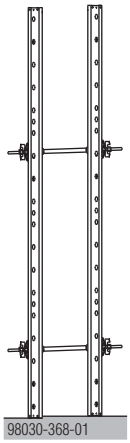
The stoppers for plugging the distance pieces are also included.

Inclined and height-mismatched positioning

Thanks to the special shape of the Super-plate, the panels can be inclined on one or both sides, and/or height-mismatched.



Limit-values when super plates are used

Conical on 1 side	Conical on both sides	Height mismatch
max. 4.5°	max. 2 x 4.5°	max. 0.5 cm per 10 cm of wall thickness
		
98030-366-01	98030-367-01	98030-368-01

Note:
Secure inclined panels against uplift.
Do not place Frami Xlife panels upside-down (corner ties must be at top).

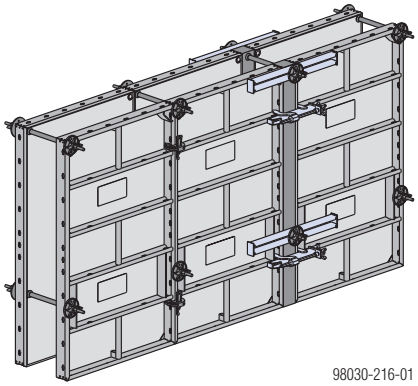
Length adjustment using closures

Closures: 0 - 15 cm

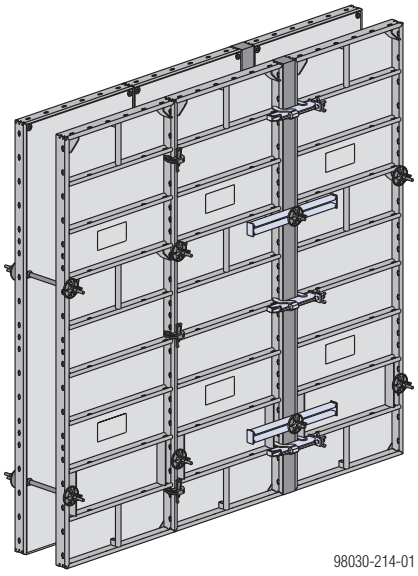
with fitting timber and adjustable clamp

By combining the fitting-timber widths of 2, 3, 5, and 10 cm in various ways, the closures can be made in 1 cm increments.

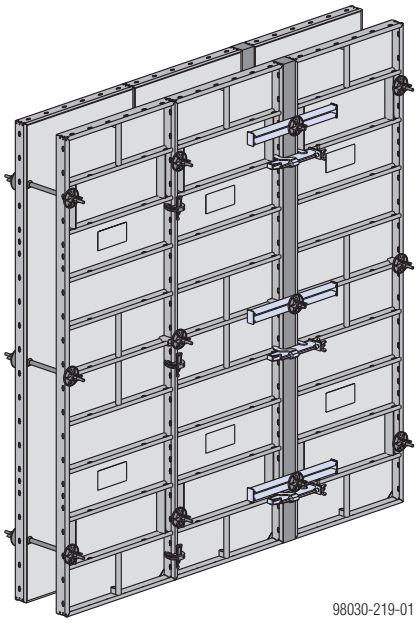
Frami universal waling:
Permitted moment: 1.3 kNm



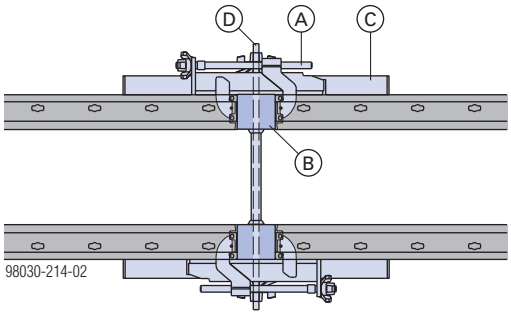
Shown here on Frami Xlife panels 1.50m.



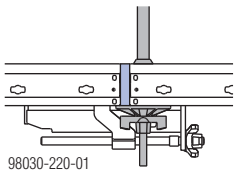
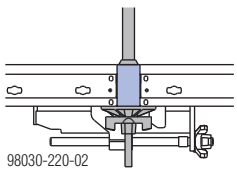
Shown here on Frami Xlife panels 2.70m.

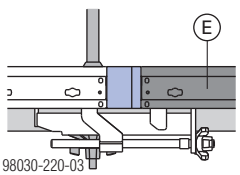
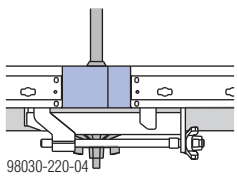


Shown here on Frami Xlife panels 3.00m.



A Frami adjustable clamp
B Frami fitting timber
C Frami universal waling (for supporting form-ties)
D Form-tie

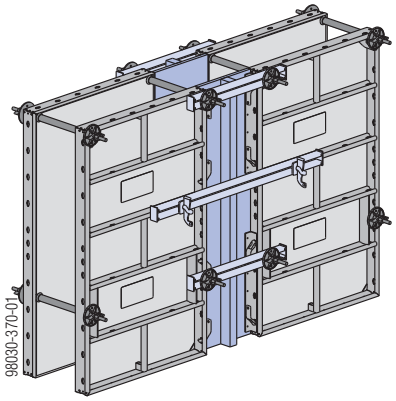
Closures up to **2 cm**	Closures up to **5 cm**
Ties through panel, without Universal waling	Ties through fitting timber, without Universal waling
	

Closures up to **7.5 cm**	Closures up to **15 cm**
Ties through panel, with Universal waling	Ties through fitting timber, with Universal waling
	

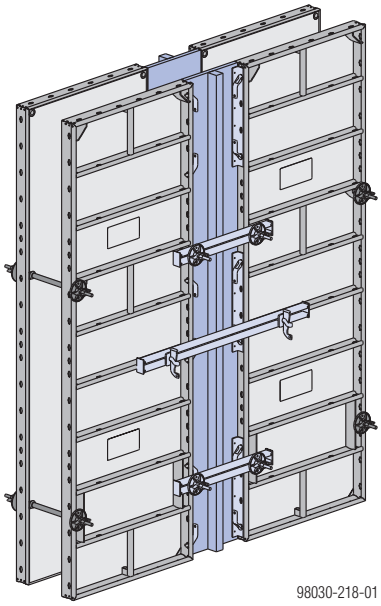
E Frami Xlife panel (max. 0.75m)

Closures: 10 - 50 cm

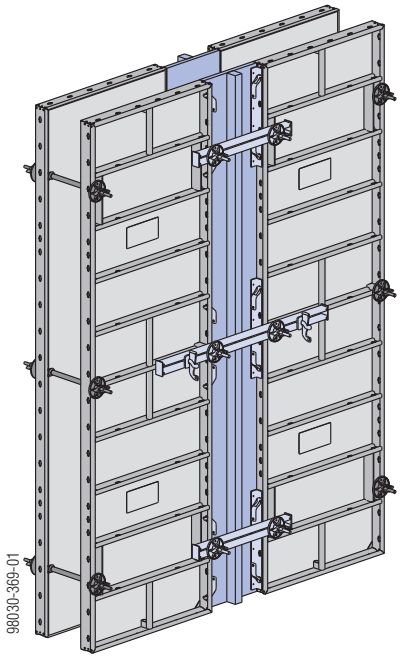
with plywood support and formwork sheet



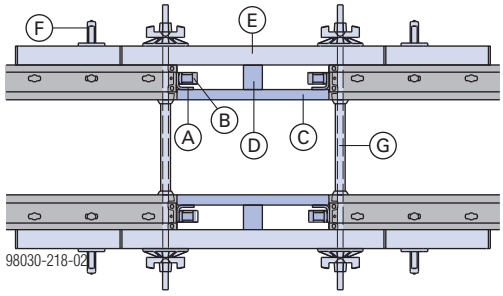
Shown here on Frami Xlife panels 1.50m.



Shown here on Frami Xlife panels 2.70m.



Shown here on Frami Xlife panels 3.00m.



A	Frami plywood support
B	Frami clip
C	Formwork sheet
D	Squared timber
E	Frami universal waling 1.25 m
F	Frami wedge clamp
G	Form-tie

NOTICE

Where tensile loads occur (on corners and stop-ends), suitable tension anchoring must be provided.

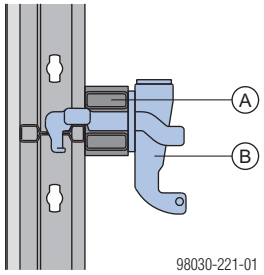
Possible ways of attaching Universal walings:

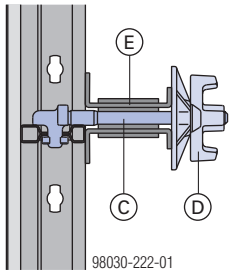
For clamp-on parts with an **overall height of 5 cm** (Frami universal waling **(A)**):

- Frami wedge clamp **(B)**

For clamp-on parts with an **overall height of between 5 and 12 cm** (e.g. Framax universal waling **(E)**):

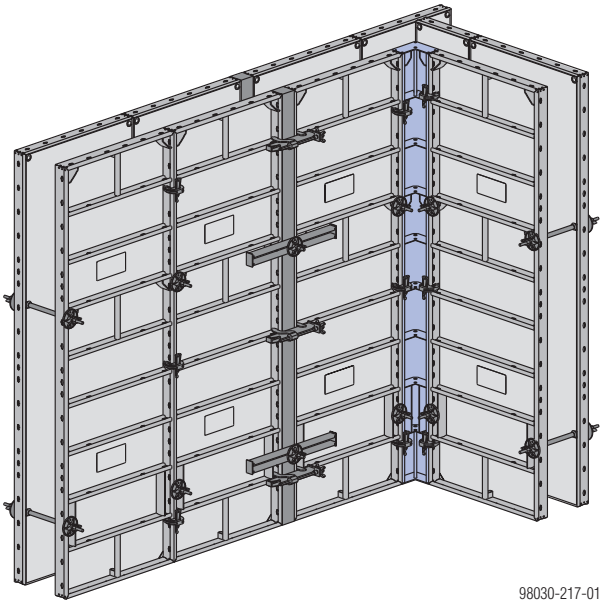
- Frami universal fixing bolt **(C)** + Super-plate **(D)**



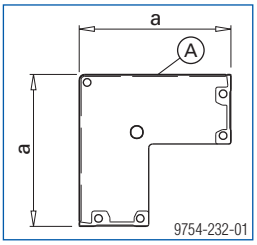


90 degree corners

The corner solutions are based upon the strong, torsion-proof **Frami inside corner**.



Shown here on Frami Xlife panels 2.70m.



a ... 20 cm

A	Steel form-facing

There are **2 ways** of forming right-angled **outside corners**:

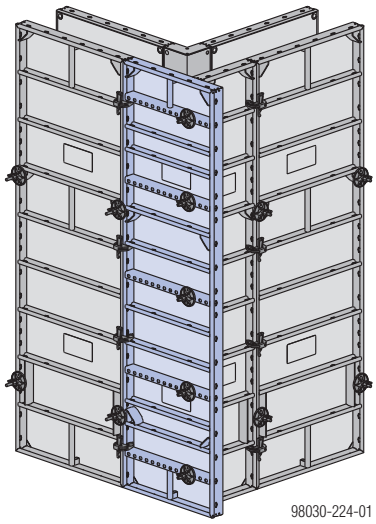
- with an Xlife universal panel
- with a Frami outside corner

Note:

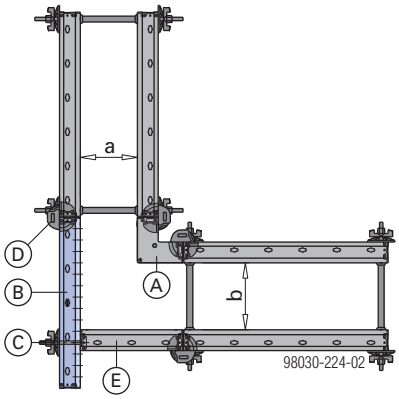
For details regarding extra inter-panel connections on outside corners (for increased tensile loads), see the section headed 'Inter-panel connections for increased tensile loads'.

with a Frami Xlife universal panel

When this panel is used, a wall-thickness grid with 5 cm increments is available.



Shown here on Frami Xlife panels 2.70m.



a ... 25 cm
b ... 30 cm

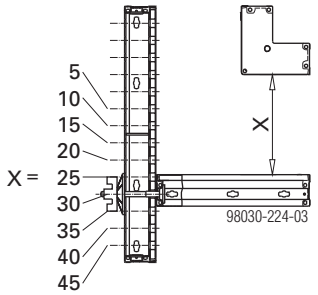
A	Frami inside corner
B	Frami Xlife universal panel
C	Frami universal fixing bolt + Super plate 15.0
D	Frami clamp
E	Frami Xlife panel 0.45m

Note:

Close off unneeded grid holes in the form-facing of the Frami Xlife universal panels with **Frami plugs**.

Frami Xlife universal panel 0.75m

Attainable wall thicknesses in 5 cm grid:

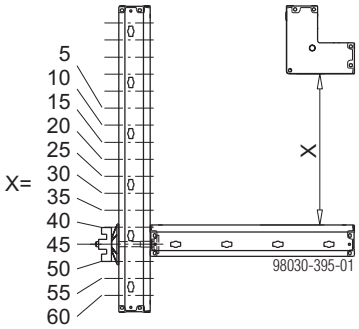


Required numbers of Frami universal fixing bolts + Super-plates 15.0:

Frami Xlife universal panel 0.75x1.20m	2 of each
Frami Xlife universal panel 0.75x1.50m	3 of each
Frami Xlife universal panel 0.75x2.70m	5 of each
Frami Xlife universal panel 0.75x3.00m	6 of each

Frami Xlife universal panel 0.90m

Atainable wall thicknesses in 5 cm grid:



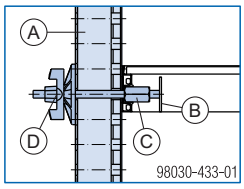
Required numbers of Frami universal fixing bolts + Super plates 15.0:

Frami Xlife universal panel 0.90x1.20m	3
Frami Xlife universal panel 0.90x1.50m	3 *)
Frami Xlife universal panel 0.90x2.70m	6
Frami Xlife universal panel 0.90x3.00m	7

*) + 1 hexagon nut, tie rod and super plate

Note:

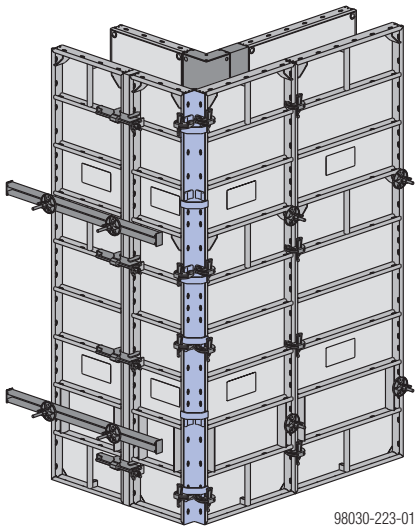
In the case of the universal panel 0.90x1.50m, installation of the Frami universal fixing bolt in one of the perforated profiles is not possible (collision with bracing at form-tie hole of the Frami Xlife panel). Use Hexagon nut 15.0 + Tie rod 15,0mm.



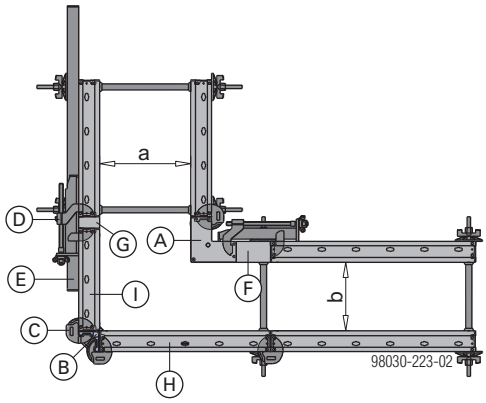
A Frami Xlife universal panel 0.90x1.50m
B Bracing at form-tie hole of the Frami Xlife panel
C Hexagon nut 15.0 + Tie rod 15,0mm (length: 250 mm)
D Super plate 15.0

with a Frami outside corner

The Frami outside corner is an easy and problem-free way of forming corners in narrow trench situations or where large wall thicknesses are called for.



Shown here on Frami Xlife panels 2.70m.



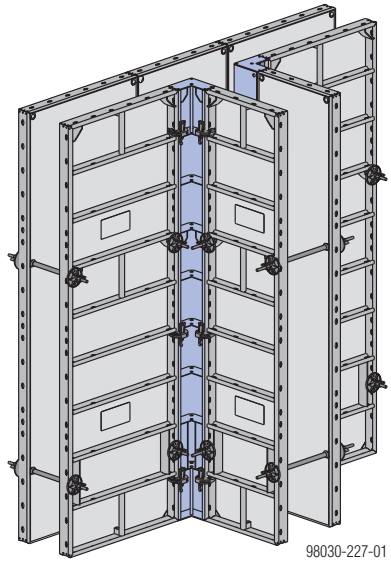
a ... 40 cm
b ... 30 cm

A Frami inside corner
B Frami outside corner
C Frami clamp
D Frami adjustable clamp
E Frami universal waling
F Fitting timber on the inside (min. 4.0 cm - max. 15.0 cm)
G Fitting timber on the outside (max. 7.5 cm)
H Frami Xlife panel 0.75m (max. 0.75m if there is a closure beside this panel)
I Frami Xlife panel 0.45m (max. 0.75m if there is a closure beside this panel)

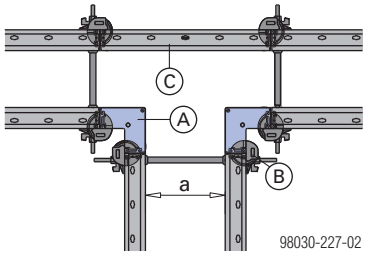
Required numbers of Frami clamps:

	Up to wall thickness 40 cm	Up to wall thickness 60 cm
Outside corner 1.20m	4	6
Outside corner 1.50m	4	6
Outside corner 2.70m	8	12
Outside corner 3.00m	10	12

Example: T-junction



Shown here on Frami Xlife panels 2.70m.



a ... 35 cm

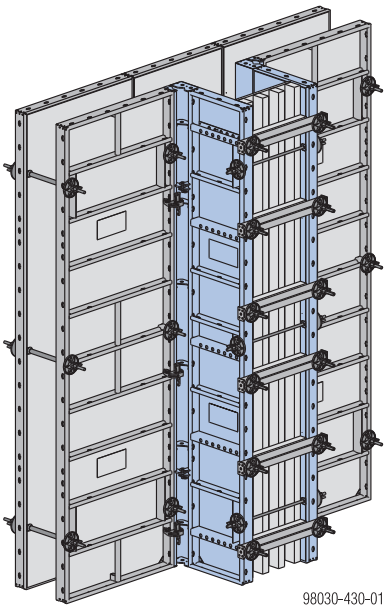
A	Frami inside corner
B	Frami clamp
C	Frami Xlife panel 0.75m

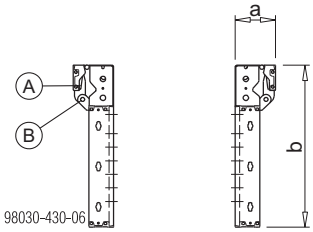
Pilasters

Frami Xlife pilaster panels are used for the non-tied forming of pilasters.

Product features:

- No need for ties through the pilaster.
- The integral folding function makes the stripping procedure faster.
- Depending on the stop-end used, pilasters up to 60 cm deep and 60 cm wide are possible.
- Panel heights:
  - 1.20m
  - 1.50m
  - 3.00m





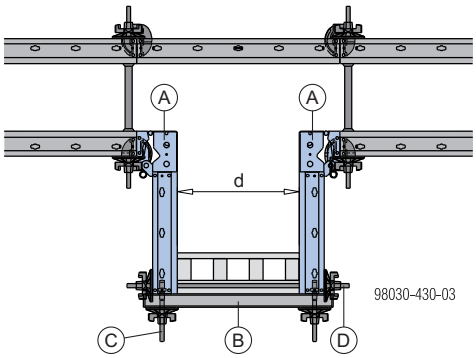
a ... 15cm
b ... 60 cm

A	Frami Xlife pilaster panel
B	Fastening bolt for fixing at right-angles

Required number of connectors per stop-end:

Panel height	Frami universal fixing bolt + Super plates 15.0
1.20m	4
1.50m	6
3.00m	12

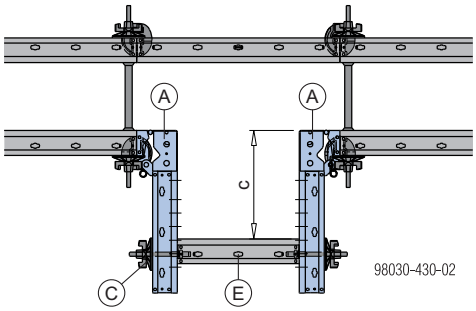
Example, of stop-end with Universal waling



d ... max. 60 cm

A	Frami Xlife pilaster panel
B	Frami universal waling
C	Frami universal fixing bolt 5-12cm + Super plate 15.0
D	Doka tie rod system

Example, stop-end with Frami Xlife panel

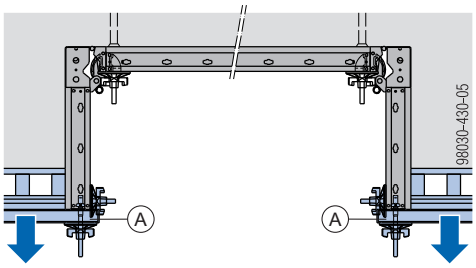


c ... 20 to 45 cm in 5 cm grid
(or 60 cm with universal panel as stop-end)

A	Frami Xlife pilaster panel
C	Frami universal fixing bolt 5-12cm + Super plate 15.0
E	Frami Xlife pilaster panel **0.45m** or **0.60m**

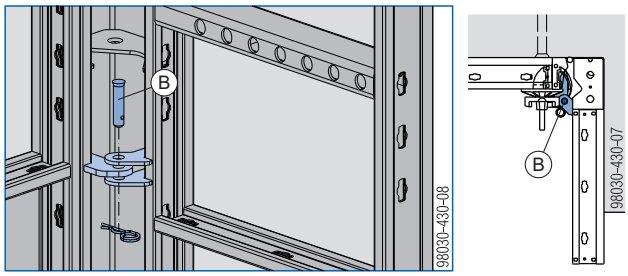
Opening the formwork

➤ Remove the stop-end formwork.



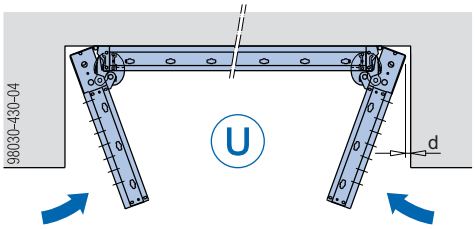
A	Stop-end formwork

➤ Remove the fastening pin.



B	Fastening pin

➤ Swivel pilaster panels inward.



d ... formwork-striking play 2.5 cm

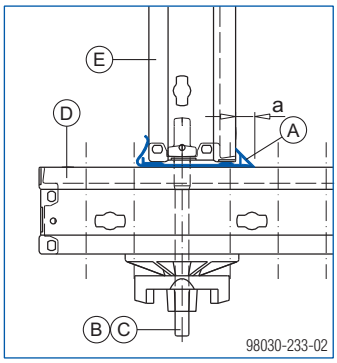
U	Unit to be repositioned

➤ Detach the entire unit from the concrete and crane-lift it to the next position.

Edges

with the Frami frontal triangular ledge

The Frami frontal triangular ledge can be pushed over the end face of the panel (no nails needed). For forming outside corners, it is used with the universal panel (integrated slot grid for universal fixing bolts). It is also possible to form edges using the standard triangular ledge, of course.

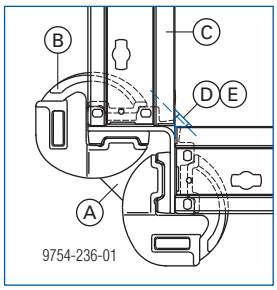


a ... 20 mm

A	Frami frontal triangular ledge or Framax triangular ledge
B	Frami universal fixing bolt
C	Super-plate 15.0
D	Frami Xlife universal panel
E	Frami Xlife panel

with the Framax triangular ledge

Where outside corners are formed using the Frami outside corner, the Frami clamps used for the interconnection mean that the standard triangular ledge has to be used here.



A	Frami outside corner
B	Frami clamp
C	Frami Xlife panel
D	Framax triangular ledge
E	Wire nail 22x40

Triangular ledges can also be used on corners formed using the Universal panel.

Inter-panel connections for increased tensile loads

As a rule, the number of clamps needed to link the panels is pre-defined (see the following table from the section headed 'Inter-panel connections').

Required number of clamps (longitudinal joins):

Panel height (**upright panels**)	Number of clamps
1.20 m	2
1.50 m	2
2.70 m	3
3.00 m	3

NOTICE

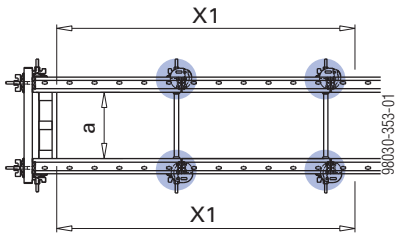
Where **increased tensile loads** need to be sustained near outside corners and stop-ends, **extra clamps are needed**.

Near stop-ends

for wall thicknesses of up to 40 cm

For wall thicknesses of **up to 40 cm, no extra clamps are required**.

for wall thicknesses from 40 cm to 70 cm

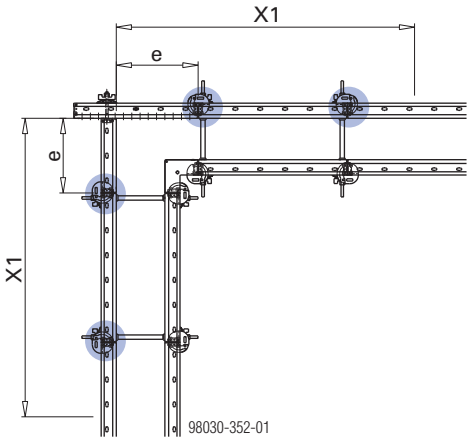


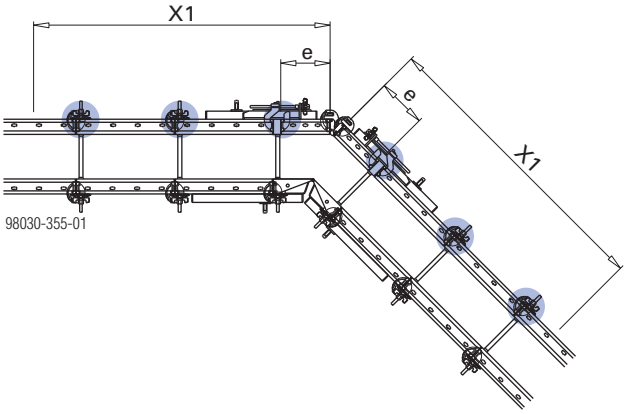
a ... 40 to 70 cm

Panel height	**Number of clamps** In zone **"X1"** (panel joints **within 1.8 m** of a stop-end)
1.20 m	2
1.50 m	2
2.70 m	3 **+ 1**
3.00 m	3 **+ 1**

Near outside corners

for panel widths up to 60 cm

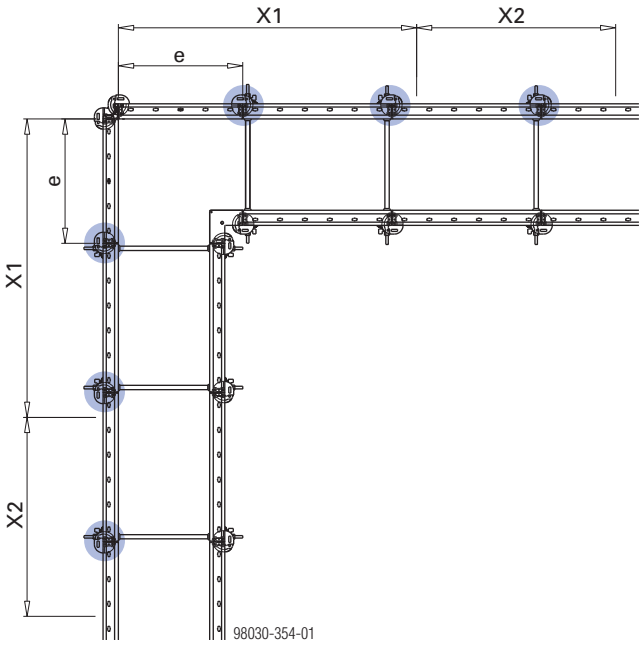


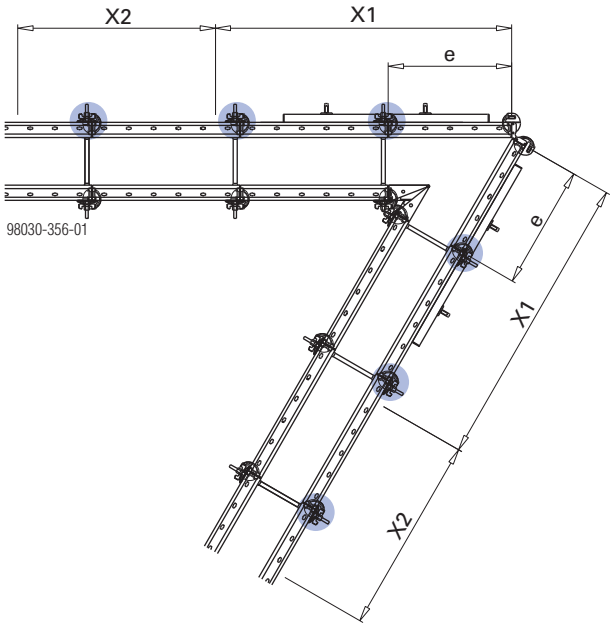


e ... up to 60 cm (panel width)

Panel height	Number of clamps In zone **"X1"** (panel joints **within 1.8 m** of an outside corner)
1.20 m	2
1.50 m	2
2.70 m	3 **+ 1**
3.00 m	3 **+ 1**

for panel widths from 60 cm to 90 cm

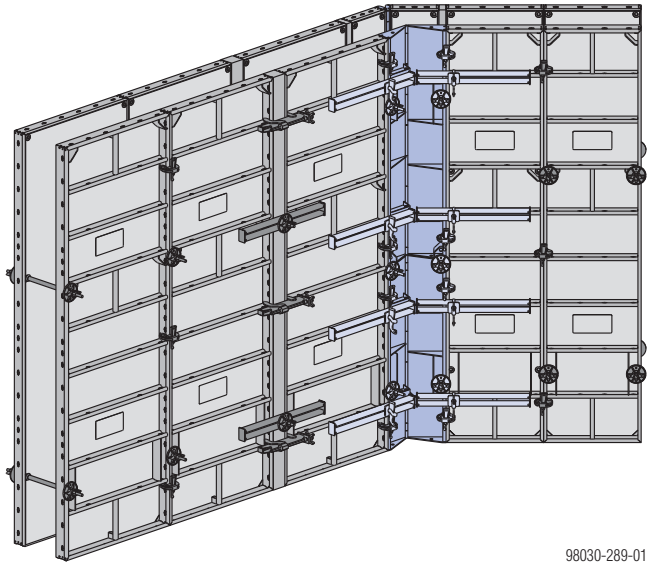




e ... > 60 cm to 90 cm (panel width)

Panel height	Number of clamps	
	In zone **"X1"** (panel joints **within 1.8 m** of an outside corner)	In zone **"X2"** (panel joints **1.8 m to 3.0 m** from an outside corner)
1.20 m	2 **+ 1**	2
1.50 m	2 **+ 1**	2
2.70 m	3 **+ 2**	3 **+ 1**
3.00 m	3 **+ 2**	3 **+ 1**

Acute & obtuse-angled corners

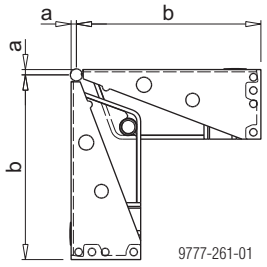


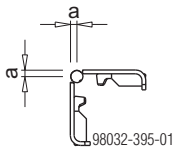
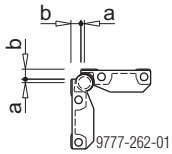
Shown here on Frami Xlife panels 2.70m.

Frami Xlife also has the perfect solution ready for acute and obtuse-angled corners – the Frami hinged corners.

Panel heights of the hinged corners:

- 1.20m
- 1.50m

Hinged inside corner I

a ... 0.7 cm b ... 24.3 cm

Hinged outside corner A (galvanised)	Hinged outside corner A (powder-coated)
	
a ... 0.85 cm	a ... 0.5 cm b ... 1.2 cm

Note:

The Hinged outside corner A (galvanised) cannot be combined with the Hinged outside corner A (powder-coated).

N° of universal walings in the outside and inside corners:

Panel height	N° of universal walings
1.20 m	4
1.50 m	4
2.70 m	8
3.00 m	8

Position of the universal walings:
In every support level of the Hinged inside corner I.

Note:

For angles of less than 120°, no universal walings are needed in inside corners.

NOTICE

Where there are closures, provide extra Universal walings as shown in the section headed 'Length adjustment using closures'.

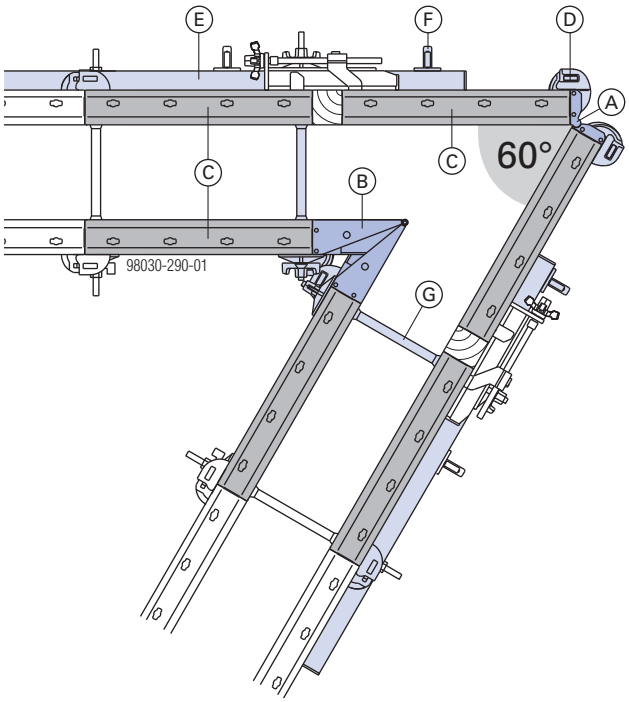
Number of Frami clamps in the hinged outside corner:

Panel height	Width of panel next to hinged outside corner	
	Up to 60 cm	Up to 90 cm
1.20 m	4	6
1.50 m	4	6
2.70 m	8	12
3.00 m	8	12

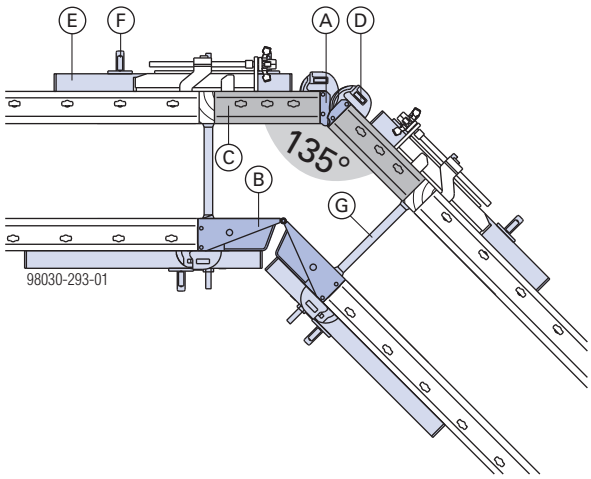
NOTICE

For details regarding extra inter-panel connections on outside corners (for increased tensile loads), see the section headed 'Inter-panel connections for increased tensile loads'.

60° - 135° angles, with hinged corners I + A

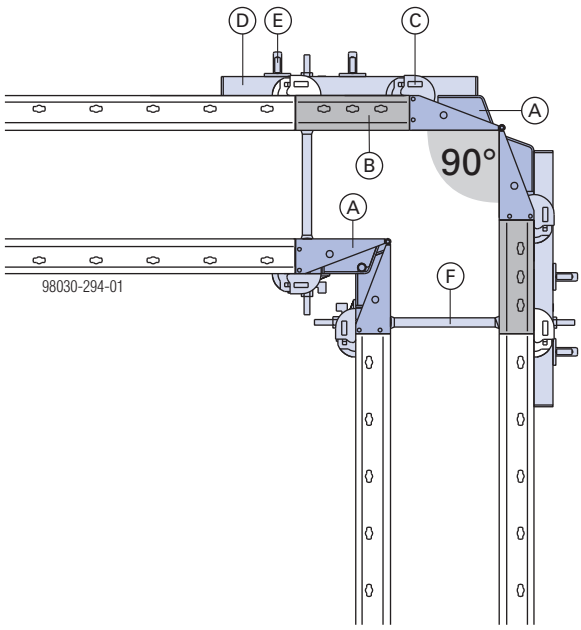


A	Frami hinged outside corner A (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
C	Frami Xlife panel (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
D	Frami clamp
E	Frami universal waling 1.25m
F	Frami wedge clamp
G	Form-tie

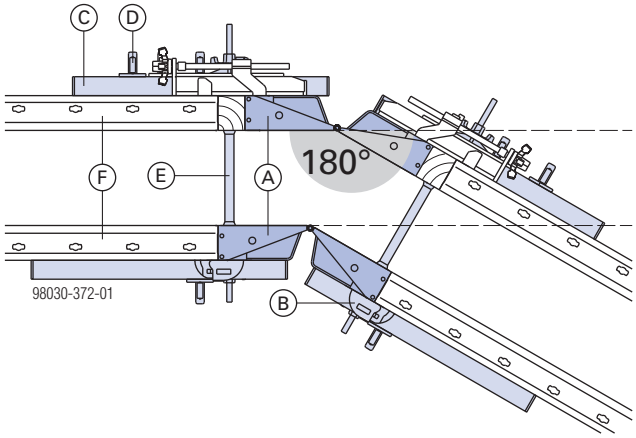


A	Frami hinged outside corner A (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
C	Frami Xlife panel (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
D	Frami clamp
E	Frami universal waling
F	Frami wedge clamp
G	Form-tie

90° - 180° angles, with hinged inside corner I only



A	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami Xlife panel (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
C	Frami clamp
D	Frami universal waling
E	Frami wedge clamp
F	Form-tie



A	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami clamp
C	Frami universal waling
D	Frami wedge clamp
E	Form-tie
F	Frami Xlife panel

Shaft formwork

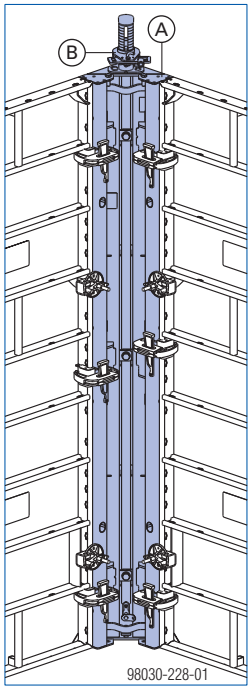
The **Framax-stripping corner I** is used to form right-angled inside corners in the shaft.
With it, the entire shaft formwork unit is detached from the wall in one piece and then repositioned by crane.

Product features:

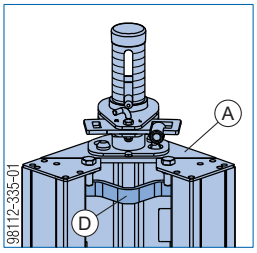
- No negative impression in the concrete.
- Formwork set-up and stripping function integrated in the inside corner.
- The entire shaft formwork is repositioned in one piece.

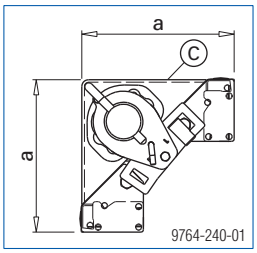
The possibilities for setting up and stripping the formwork are as follows:

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



Shown here with Frami Xlife panels 2.70m.





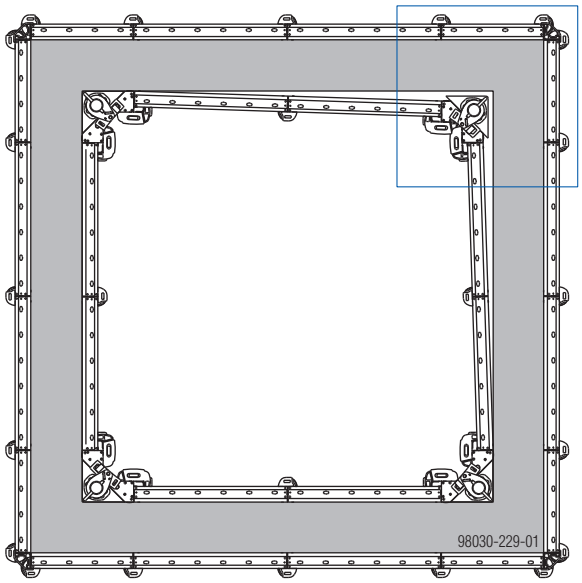
a ... 30.0 cm

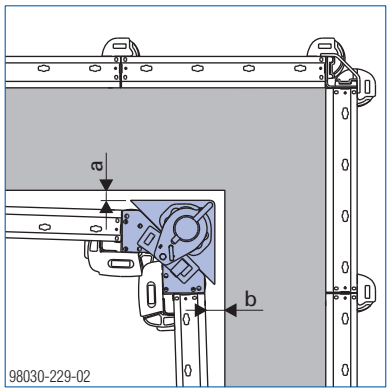
A	Framax stripping corner I
B	Framax stripping spindle I or Framax stripping spindle I with ratchet
C	Steel form-facing
D	Slinging point (to be used exclusively for lifting **only one** stripping corner on its own!)

Position of closures (fitting-timbers) in the inside shaft formwork:

- whenever possible, not directly next to the stripping corners

Formwork-stripping clearance:

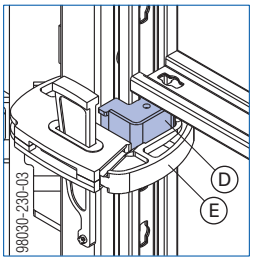




a ... 3.0 cm
b ... 6.0 cm

Inter-panel connections

The Framax stripping corner I is joined onto the Frami Xlife panels by means of **Framax quick-acting clamps RU**.
The **difference in thickness between the profiles** is bridged here by the **Frami profile adapter**.



D Frami profile adapter for Stripping corner I
E Framax quick-acting clamp RU

Required number of Framax quick acting clamps RU:

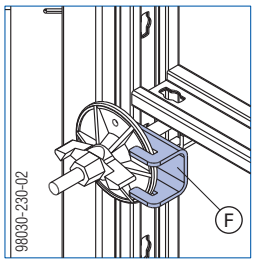
Formwork height	Panel heights	Heights of the Stripping corners I	Number of clamps
1.20 m	1.20m	1.35m	4
1.50 m	1.50m	2.70m	4
2.70 m	1.20m + 1.50m	2.70m	8
	2.70m	2.70m	6
3.00 m	1.50m + 1.50m	3.30m	8
	3.00m	3.30m	8
3.90 m	2.70m + 1.20m	2.70m + 1.35m	10
4.20 m	2.70m + 1.50m	3.30m + 1.35m	10
4.50 m	3.00m + 1.50m	3.30m + 1.35m	12
5.40 m	2.70m + 2.70m	2.70m + 2.70m	12
6.00 m	3.00m + 3.00m	3.30m + 2.70m	16

NOTICE

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

Tying the panels

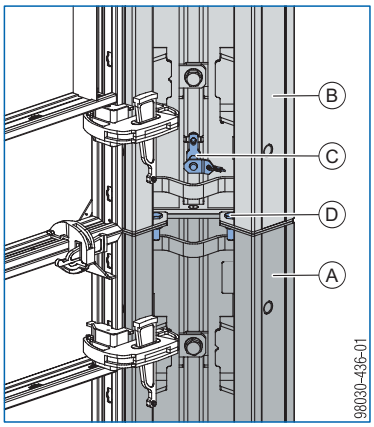
When tying the shaft formwork, the **tie-hole positions of the Frami Xlife panels** should be used.
The **difference in thickness between the profiles** is bridged here by the **Frami tie-adapter**.



F Frami tie-adapter for Stripping corner I

Vertical stacking of Framax stripping corners I

- ➤ Connect the bottom stripping corner to the framed formwork panel.
- ➤ Pull the coupling bolt out of the top stripping corner.
- ➤ Remove the two hexagon bolts from the bottom stripping corner.
- ➤ Engage the top stripping corner flush on the bottom stripping corner.
- ➤ Push the coupling bolt back in.
- ➤ Bolt the stripping corners together with the 2 hexagon bolts and hexagon nuts removed beforehand.
- ➤ Vertically stack the next framed formwork panel and connect it to the stripping corner.



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

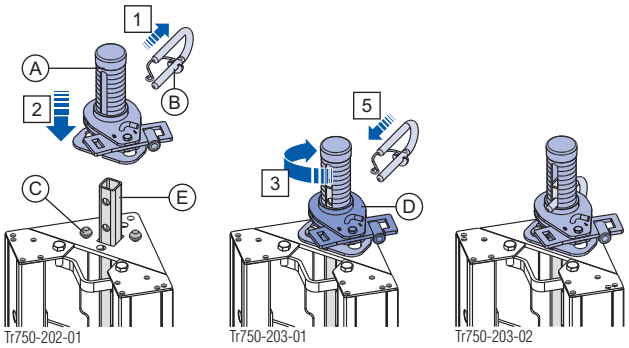
Animation: https://player.vimeo.com/video/256373947

Operating the Framax stripping corner I with stripping spindle

Assembly

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

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

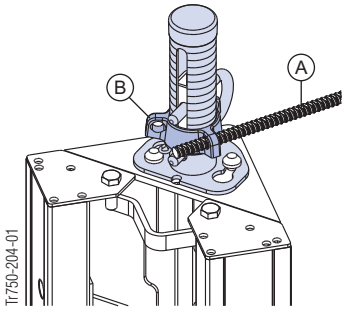


A	Framax stripping spindle I or Framax stripping spindle I with ratchet
B	U-bolt
C	Centring stud of stripping corner
D	Ratchet or spindle nut
E	Push-rod

Animation: https://player.vimeo.com/video/256374622

Operating the Framax stripping spindle I

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

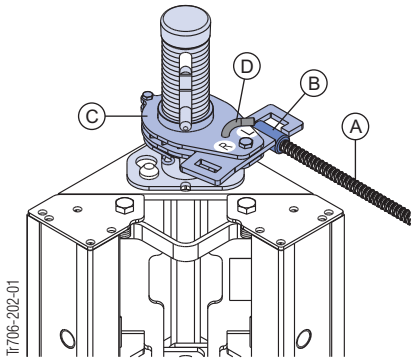


A	Tie-rod 15.0mm
B	Spindle nut

Operating the Framax stripping spindle I with ratchet

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

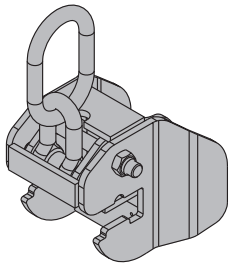
➤ **Stripping**:
- shift the change-over lever into the '**R**' position
- turn the ratchet **anti-clockwise**.



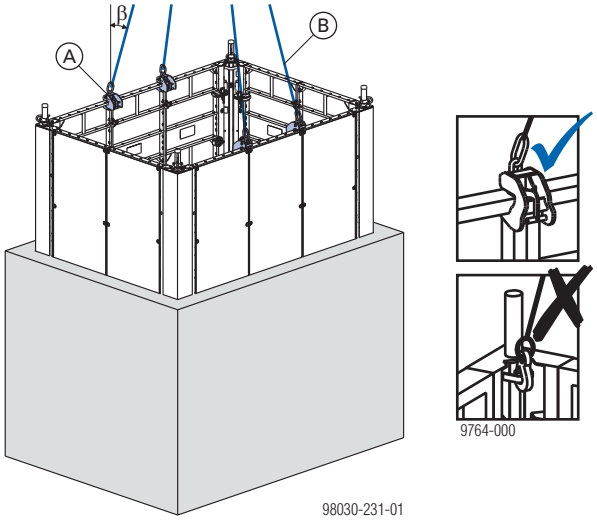
A	Tie-rod 15.0mm
B	Weldable coupler 15.0
C	Ratchet
D	Change-over lever

Lifting by crane

Frami lifting hook



Follow the Operating Instructions!



β max. 15°

A Frami lifting hook
B Four-part lifting chain

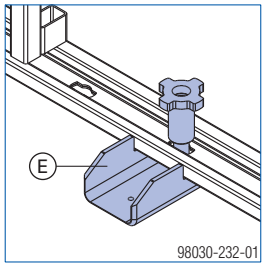
Do not use the slinging point on the Stripping corner I for lifting the shaft formwork.
➤ The shaft formwork **may only be reset using lifting hooks**.

Permitted weight of the shaft formwork:
2000 kg with 4 Framax lifting hooks

Use a lifting beam for repositioning large gangforms.

Doka shaft platform

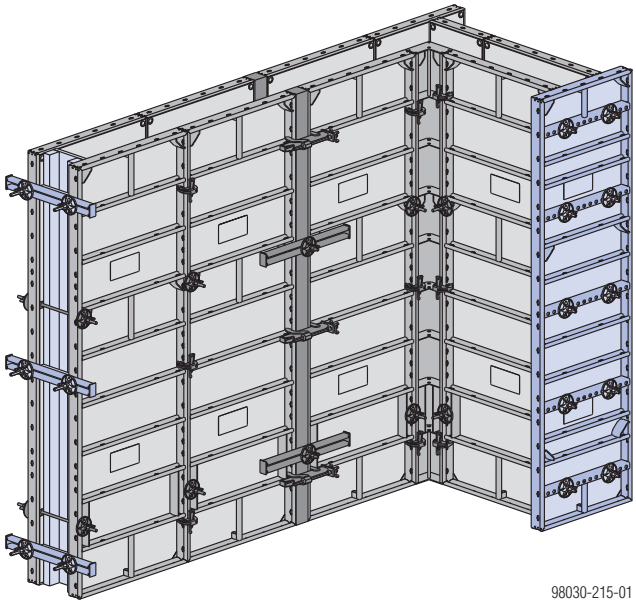
With its telescopic shaft beams, this platform can accommodate any dimension of structure. The inside formwork can be "parked" on the platform and repositioned together with the platform.
The Frami panel shoe provides increased stability on shaft platforms.



E Frami panel shoe

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

Stop-end formwork



Shown here on Frami Xlife panels 2.70m.

There are **3 possible ways** of forming **stop-ends**:

- with a Frami Xlife universal panel
- with Frami universal walings
- with Frami stop-end waler ties

NOTICE

For details regarding inter-panel connections near stop-ends (for increased tensile loads), see 'Inter-panel connections for increased tensile loads'.

Frami universal fixing bolts / Frami corner connectors:

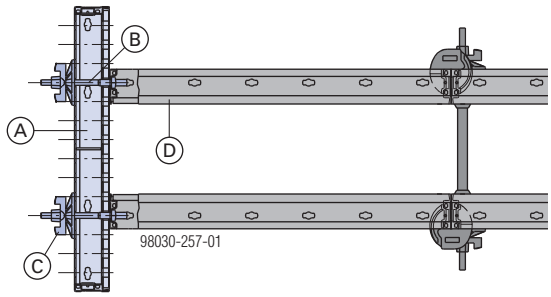
Permitted tensile load:

13.0 kN (when used in Frami Xlife panels)

15.6 kN (when used in Frami Xlife universal panels)

with a Frami Xlife universal panel

The Universal panel is mounted on the Frami Xlife panels using Universal fixing bolts 5-12cm or Corner connectors and Super plates 15.0.



A	Frami Xlife universal panel
B	Frami universal fixing bolt 5-12cm or Frami corner connector
C	Super plate 15.0
D	Frami Xlife panel

Note:

Close off unneeded grid holes in the form-facing of the Frami Xlife universal panels with **Frami plugs**.

Frami Xlife universal panel 0.75m

The continuous 5 cm hole-grid*) makes it possible to form stop-ends on walls of **up to 55 cm thick**.

*) For constructional design reasons, a deviation of -1 cm is possible here.

Number of connectors:

Panel height	Universal fixing bolts / Corner connectors + Super-plates 15.0
1.20m	4
1.50m	6
2.70m	10
3.00m	12

Frami Xlife universal panel 0.90m

The continuous 5 cm hole-grid*) makes it possible to form stop-ends on walls **up to 70 cm thick**.*)

*) For constructional design reasons, a deviation of -1 cm is possible here.

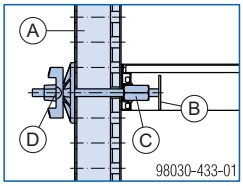
Number of connectors:

Panel height	Universal fixing bolts / Corner connectors + Super plates 15.0
1.20m	6
1.50m	6 *)
2.70m	12
3.00m	14

*) + 1 hexagon nut, tie rod and super plate

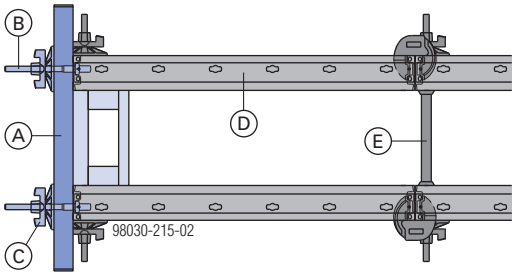
Note:

In the case of the universal panel 0.90x1.50m, installation of the Frami universal fixing bolt in one of the perforated profiles is not possible (collision with bracing at form-tie hole of the Frami Xlife panel). Use Hexagon nut 15.0 + Tie rod 15,0mm.



A	Frami Xlife universal panel 0.90x1.50m
B	Bracing at form-tie hole of the Frami Xlife panel
C	Hexagon nut 15.0 + Tie rod 15,0mm (length: 250 mm)
D	Super plate 15.0

with universal walings



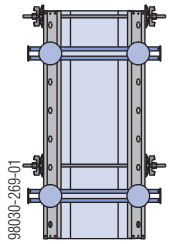
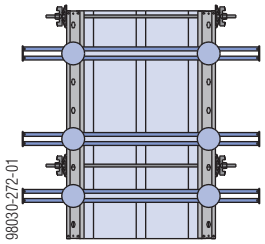
A	Frami universal waling
B	Frami universal fixing bolt 5-12cm or Frami corner connector
C	Super-plate 15.0
D	Frami Xlife panel
E	Form-tie

Frami universal waling:
Permitted moment: 1.3 kNm

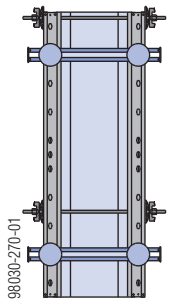
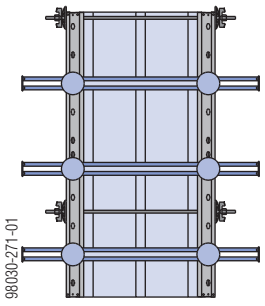
The universal waling makes it possible to precision-form continuously adjusted stop-ends across any wall thickness. The Universal walings are mounted using Universal fixing bolts 5-12cm or Corner connectors and Super-plates 15.0.

Number and position of universal walings:

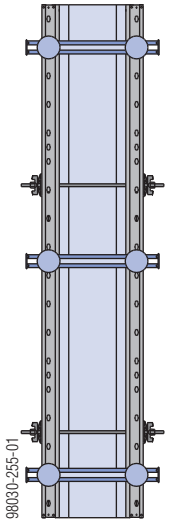
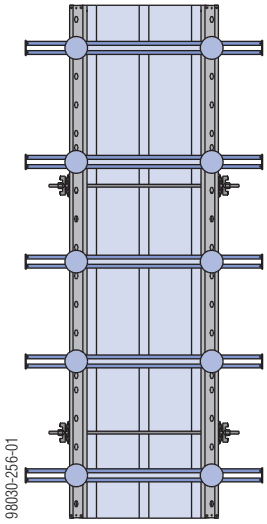
Panel height **1.20m**

Up to wall thickness **55 cm**	Up to wall thickness **60 cm**
	
2 universal walings	3 universal walings

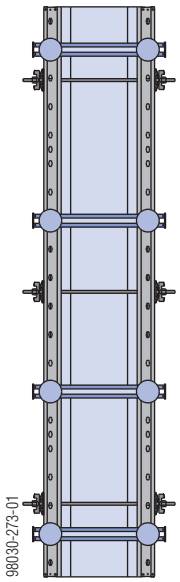
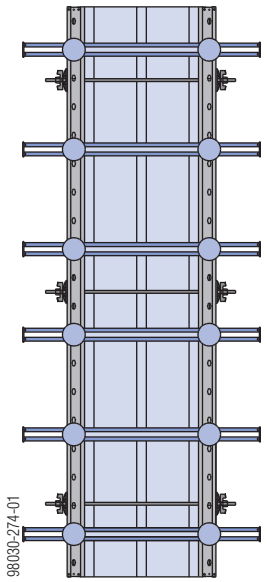
Panel height **1.50m**

Up to wall thickness **48 cm**	Up to wall thickness **60 cm**
	
2 universal walings	3 universal walings

Panel height **2.70m**

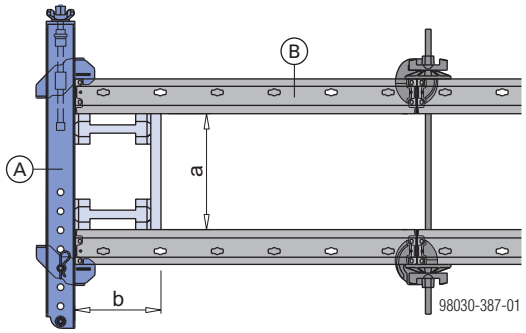
Up to wall thickness **38 cm**	Up to wall thickness **60 cm**
	
3 universal walings	5 universal walings

Panel height **3.00m**

Up to wall thickness **40 cm**	Up to wall thickness **60 cm**
	
4 universal walings	6 universal walings

with stop-end waler ties

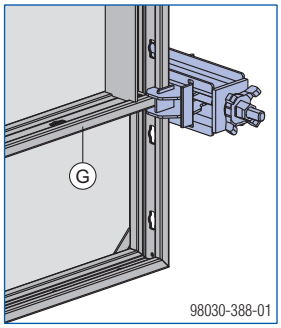
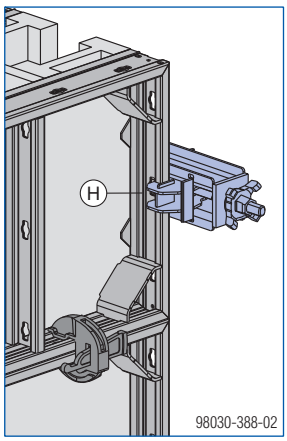
The Frami stop-end waler tie lets you form stop-ends steplessly, from wall thicknesses of 15 cm to 45 cm.



a ... 15 cm to 45 cm
b ... ≥ 20 cm (only statically necessary on panel width 0.90m)

A Frami stop-end waler tie 15-45cm
B Frami Xlife panel

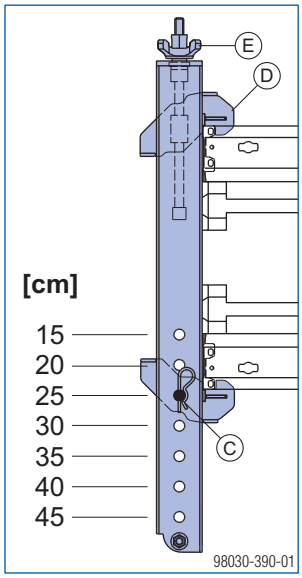
Position of stop-end waler tie:

On a vertically placed panel	On a horizontally placed panel
	

G Cross profile
H Middle of panel

How to mount:

➤ Fix the required wall thickness with a spar-pin.
➤ Position the stop-end waler tie on the formwork.
➤ Fine-adjust the screwjack clamp with the star grip nut, and tighten it.



C Spar-pin
D Screwjack clamp
E Star grip nut

Fresh-concrete pressure $\sigma_{hk, max}$ = 40 kN/m²

Required numbers of stop-end waler ties:

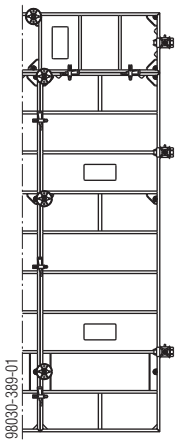
Panel height (upright panels)	Frami stop-end waler ties
1.20m	2
1.50m	2
2.70m	2
3.00m	3

Panel width (horizontal panels)	Frami stop-end waler ties
0.30m to 0.90m	1*)

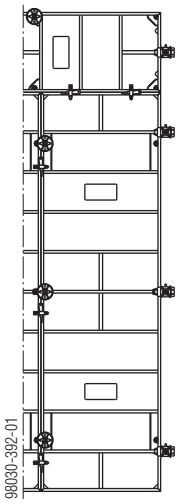
*) On single panels not forming part of a gang (e.g. when being used as foundation formwork), at least 2 stop-end waler ties must be used.

Positions of the stop-end waler ties:

Example
Formwork height 3.15 m
(2.70m + 0.45m)



Example
Formwork height 3.60 m
(3.00m + 0.60m)



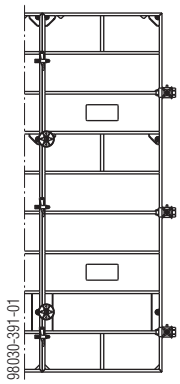
Fresh-concrete pressure $\sigma_{hk, max, hydr}$ = 67.5 kN/m²

Required numbers of stop-end waler ties:

Panel height	Frami stop-end waler ties
2.70m	3

Positions of the stop-end waler ties:

Formwork height = panel height 2.70m



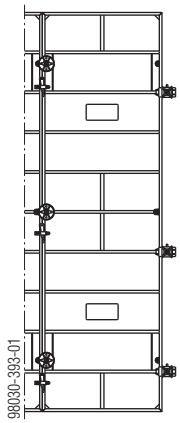
Fresh-concrete pressure $\sigma_{hk, max}$ = 60 kN/m²

Required numbers of stop-end waler ties:

Panel height	Frami stop-end waler ties
3.00m	3

Positions of the stop-end waler ties:

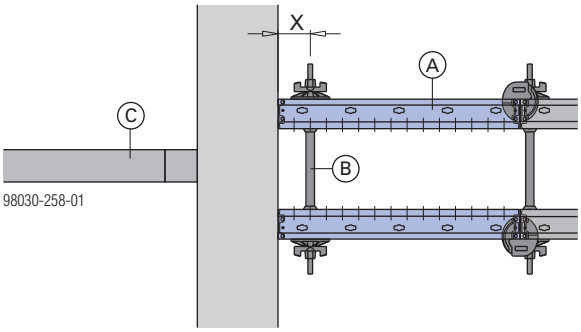
Formwork height = panel height 3.00m



Wall junctions

Right-angled connections

with a Frami Xlife universal panel



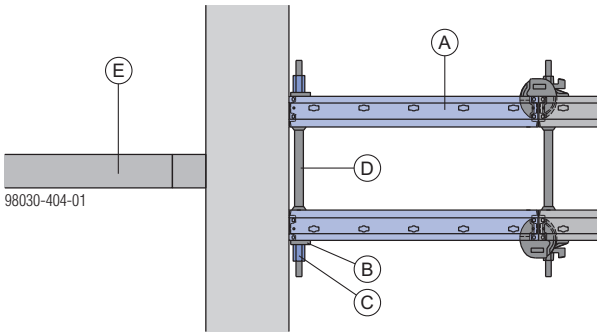
X ... max. 25 cm

A Frami Xlife universal panel
B Form-tie
C In-place timber brace

Number of form-ties in Universal panel:

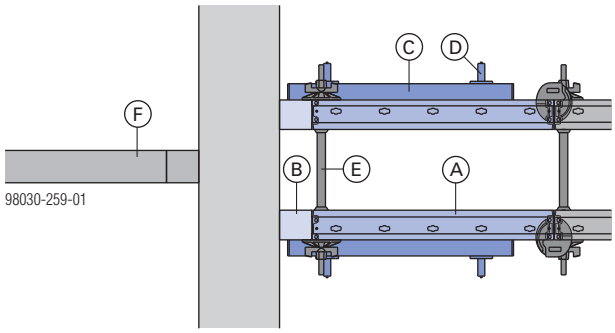
		Panel width	
		0.75m	0.90m
Panel height	1.20m	2	3
	1.50m	3	4
	2.70m	5	6
	3.00m	6	7

with Frami Xlife panels and pressure plate 8/9



A Frami Xlife panel
B Frami pressure plate 8/9
C Hexagon nut 15.0
D Doka tie rod system 15.0mm
E In-place timber brace

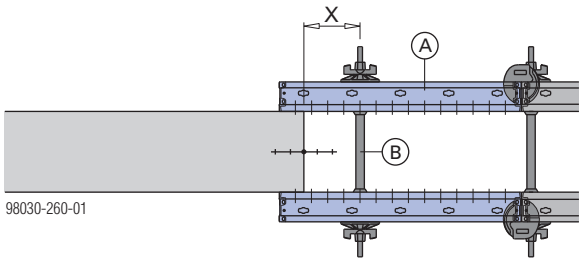
with Frami Xlife panels and squared timbers



A Frami Xlife panel
B Squared timber (min. 3.0 cm up to max. 10 cm)
C Universal waling (not needed if the squared timber is less than 5 cm wide)
D Frami wedge clamp
E Form-tie
F In-place timber brace

In-line connections

with a Frami Xlife universal panel



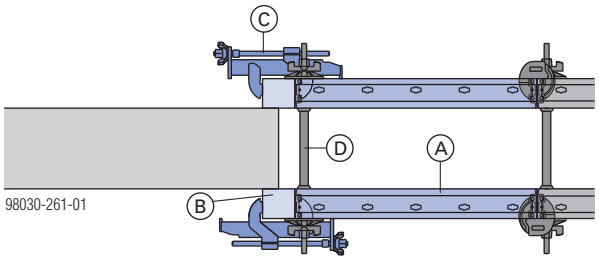
X ... max. 25 cm

A Frami Xlife universal panel
B Form-tie

Number of form-ties in Universal panel:

		Panel width	
		0.75m	0.90m
Panel height	1.20m	2	3
	1.50m	3	4
	2.70m	5	6
	3.00m	6	7

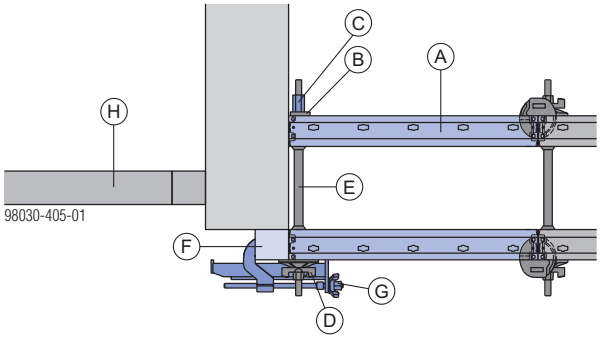
with Frami Xlife panels and squared timbers



A Frami Xlife panel
B Squared timber
C Adjustable clamp
D Form-tie

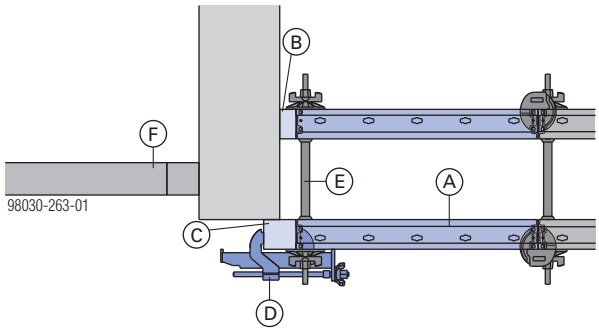
Corner connections

without closure

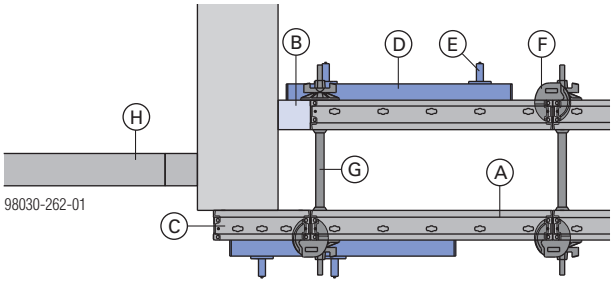


A Frami Xlife panel
B Frami pressure plate 8/9
C Hexagon nut 15.0
D Super plate 15.0
E Doka tie rod system 15.0mm
F Squared timber
G Adjustable clamp
H In-place timber brace

with closure



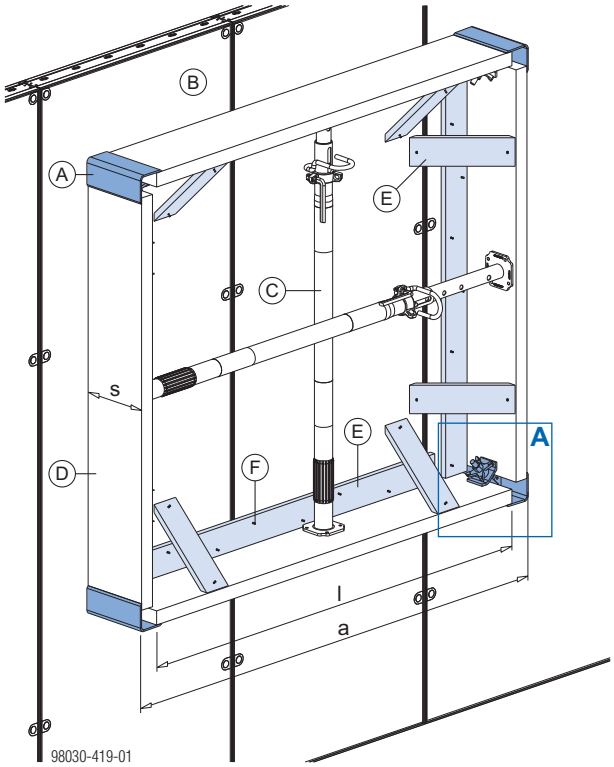
A Frami Xlife panel
B Squared timber (min. 3 cm up to max. 5 cm)
C Squared timber
D Adjustable clamp
E Form-tie
F In-place timber brace



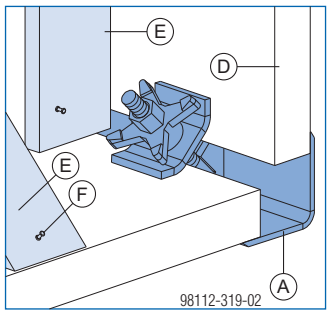
A Frami Xlife panel
B Squared timber (min. 3 cm up to max. 10 cm)
C Frami Xlife panel 0.30m
D Universal walings (not needed if the squared timber is less than 5 cm wide)
E Frami wedge clamp
F Frami clamp
G Form-tie
H In-place timber brace

Window and door openings

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



Close-up A:



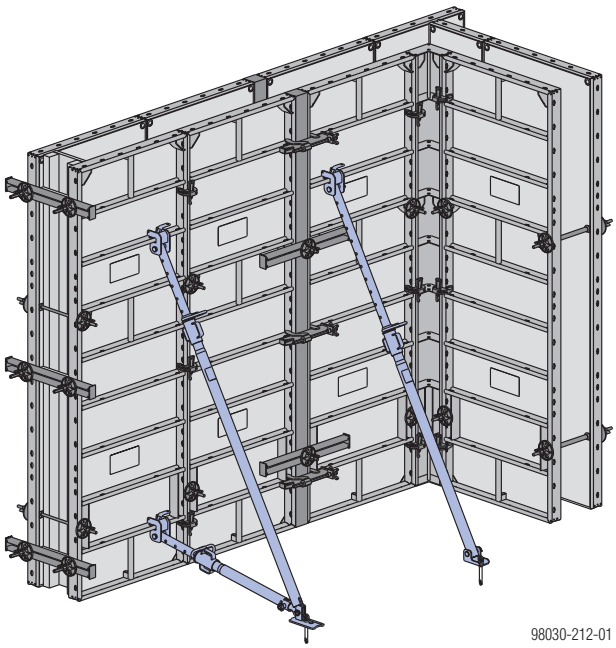
a ... clear width of opening
l ... length of plank= a minus 12 cm
s ... plank width = wall thickness

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

Assembly:

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

Plumbing accessories



Shown here on Frami Xlife panels 2.70m.

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

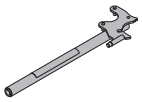
WARNING

Risk of the formwork tipping over!

- ➤ Formwork elements must be held stable **in every phase** of construction work!
- ➤ Observe all applicable safety regulations!
- ➤ If **high wind speeds** are likely, and when work finishes for the day or before prolonged work-breaks, always take extra precautions to fix the formwork in place.
  Suitable precautions:
  - set up the opposing formwork
  - place the formwork against a wall
  - anchor the formwork to the ground (e.g. with Frami floor fixing plates)

Universal dismantling tool

For easy operation of the spindle nuts.



Structural design

Note:

Consult the structural-design tables in the section for the prop heads used!

The values stated in the tables apply for a wind w_e = 0.65 kN/m². This results in an impact pressure q_p = 0.5 kN/m² (102 km/h) where $c_{p, net}$ = 1.3. The greater wind loads encountered at exposed formwork-ends must be restrained by additional plumbing accessories (e.g. struts or pipe-braces). In cases where higher wind pressure is encountered, the number of struts must be determined by statical calculation!

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

Note:

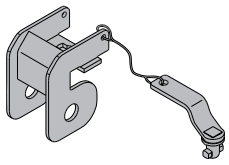
Every gang-form must be supported by **at least 2 plumbing accessories**.

Example: Where the formwork height is 3.00 m, the following are needed for every 5.40 m wide gang-form:

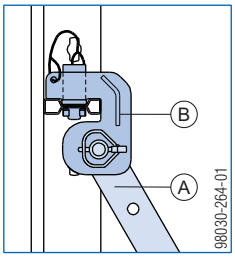
- **with the Strut head EB**
  - 5 Plumbing struts 260 or
  - 4 panel struts 340
- **with the Frami prop head EB**
  - 3 Plumbing struts 260 or
  - 3 Panel struts 340
- **with the Frami connection profile**
  - 3 Plumbing struts 260
  - 2 Panel struts 340

Fixing the struts to the formwork

with the Strut head EB



Connection options: Cross profile or frame profile horizontal



A Panel strut 340 IB or Plumbing strut 260 IB
B Strut head EB

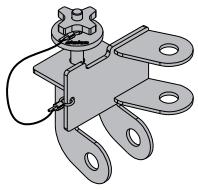
Note:

Connection to cross profile of the Frami Xlife panel 2.40x2.70m is not possible!

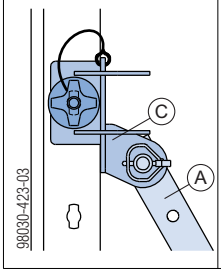
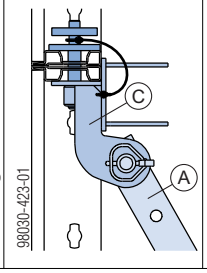
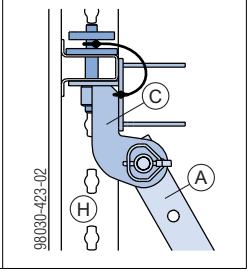
Structural design:

	Formwork height [m]	Permissible spacing [m]
Plumbing strut 260	1.80	2.10
	2.25	1.90
	2.70	1.35
	3.00	1.20
	3.60	0.80
Panel strut 340	2.70	1.45
	3.00	1.35
	3.60	1.00
	4.20	0.95
	4.50	0.70
Max. anchoring load: F_{exist} = **4.5 kN** (actual load) F_d = **6.8 kN** (design value incl. safety factors)		

with the Frami prop head EB



Connection options:

Cross profile or frame profile **vertical**	**Panel joint**	Cross profile **horizontal**, panel 2.40x2.70m
		

A Panel strut 340 IB or 540 IB or Plumbing strut 260 IB
C Frami prop head EB
H Frami Xlife panel 2.40x2.70m

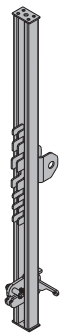
NOTICE

The structural design applies for the connection options as shown.
In the case of horizontal connection to the cross profile (panel widths 0.30 to 0.90 m) or to the frame profile, the structural design with **Strut head EB** has to be used!

Structural design:

	Formwork height [m]	Permissible spacing [m]
Plumbing strut 260	1.80	3.50
	2.10	2.90
	2.40	2.50
	2.70	2.40
	3.00	2.10
	3.30	1.90
	3.60	1.60
Max. anchoring load: F_{exist} = **7.7 kN** (actual load) F_d = **11.6 kN** (design value incl. safety factors)		
Panel strut 340	2.70	2.70
	3.00	2.50
	3.30	2.30
	3.60	1.90
	3.90	1.70
	4.20	1.40
	4.50	1.30
Panel strut 540	3.60	2.60
	3.90	2.20
	4.20	2.10
	4.50	2.00
	4.80	1.80
	5.10	1.70
	5.40	1.50
Max. anchoring load: F_{exist} = **8.0 kN** (actual load) F_d = **12.0 kN** (design value incl. safety factors)		

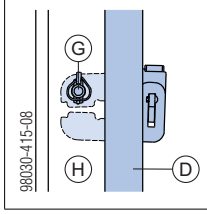
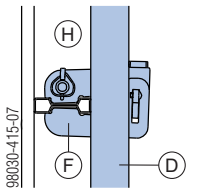
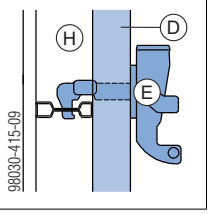
with the Frami connection profile EB



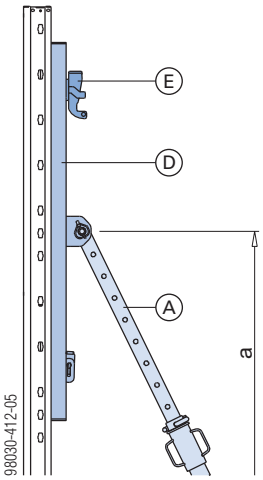
Note:

On vertically stacked panels (panel joint), the Frami connection profile takes over the function of the universal waling.

Connection options:

Connection at bottom		Connection at top
Cross profile **vertical**	Cross profile **horizontal**	Cross profile or frame profile
		

F Profile clamping of the connection profile
G Pin of the connection profile
D Frami connection profile EB
E Frami wedge clamp
H Frami Xlife panel **(not panel 2.40x2.70m!)**



a ... Connection height

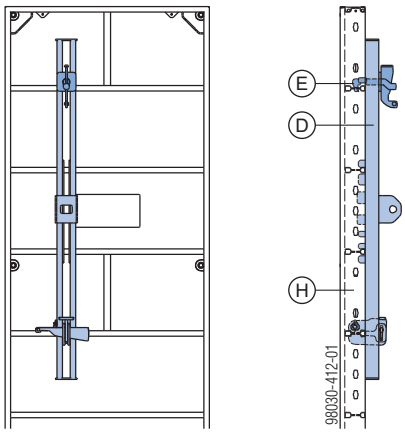
A Panel strut 340 IB or 540 IB or Plumbing strut 260 IB
D Frami connection profile EB
E Frami wedge clamp

Structural design:

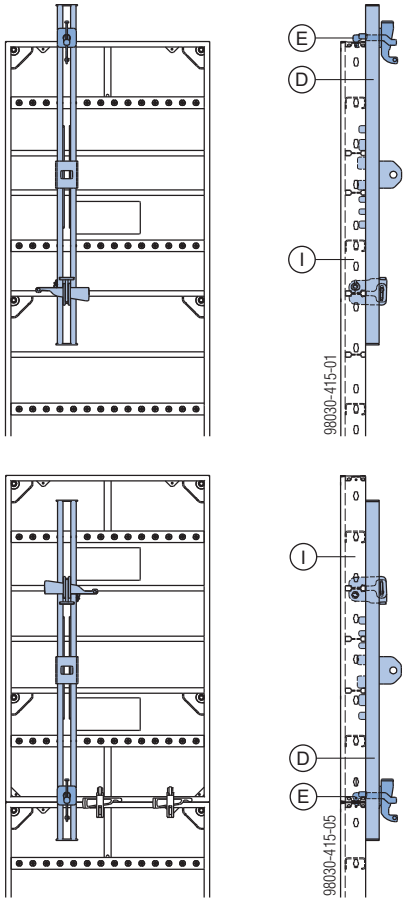
	Formwork height [m]	Connection height [m]	Permissible spacing [m]
Plumbing strut 260	1.80	1.50	3.50
	2.10	1.50	2.90
	2.40	1.65	2.50
	2.70	1.95	2.40
	3.00	1.95	2.10
	3.30	2.25	1.90
	3.60	2.25	1.60
Max. anchoring load: F_{exist} = **7.7 kN** (actual load) F_d = **11.6 kN** (design value incl. safety factors)			
Panel strut 340	2.70	1.95	4.50
	3.00	2.25	4.20
	3.30	2.70	3.10
	3.60	2.70	2.70
	3.90	2.70	2.30
	4.20	2.70	2.00
	4.50	3.00	1.50
Panel strut 540	3.60	2.70	4.30
	3.90	3.15	3.80
	4.20	3.45	3.60
	4.50	3.75	3.50
	4.80	3.90	3.10
	5.10	4.35	2.80
	5.40	3.75	2.50
	5.70	4.20	2.30
	6.00	4.35	2.00
Max. anchoring load: F_{exist} = **13.5 kN** (actual load) F_d = **20.3 kN** (design value incl. safety factors)			

Possible positions of the Frami connection profile

Cross profiles:

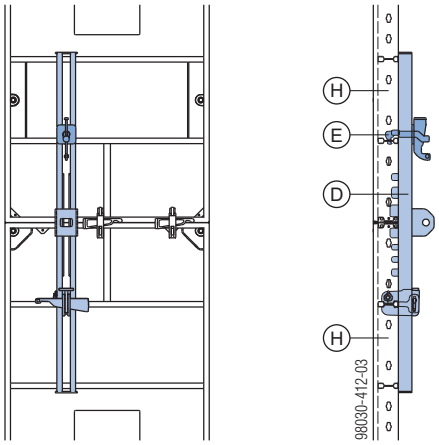


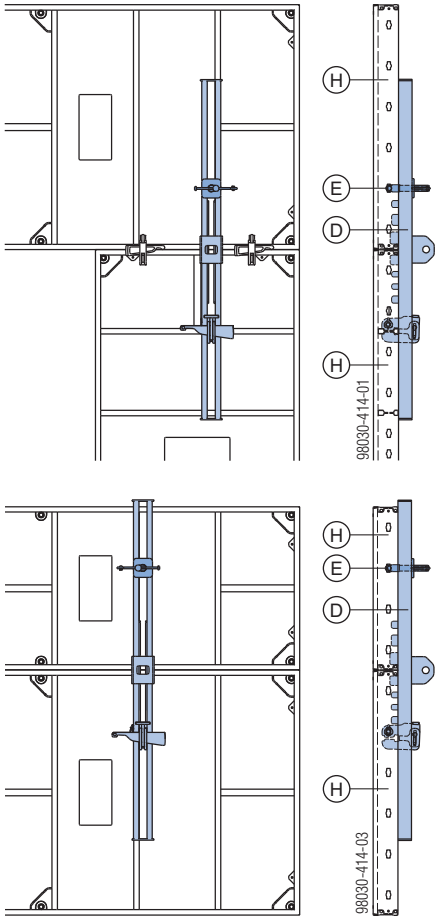
D Frami connection profile EB
E Frami wedge clamp
H Frami Xlife panel **(not panel 2.40x2.70m!)**



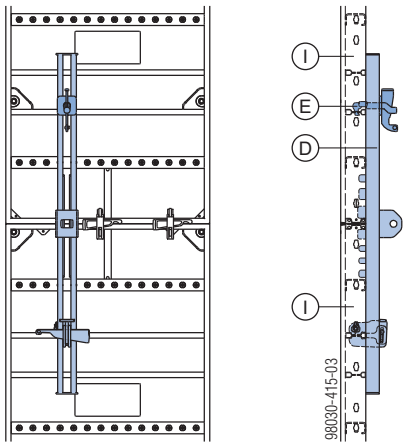
D Frami connection profile EB
E Frami wedge clamp
I Frami Xlife universal panel

Inter-panel joint (universal waling function):





D Frami connection profile EB
E Frami wedge clamp
H Frami Xlife panel **(not panel 2.40x2.70m!)**

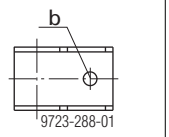
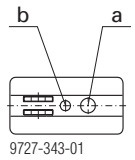


D Frami connection profile EB
E Frami wedge clamp
I Frami Xlife universal panel

Fixing to the ground

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

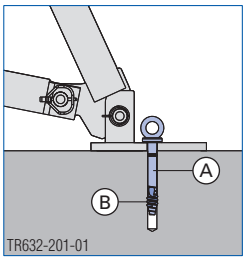
Drilled holes in footplate

Plumbing strut 260	Panel struts
	

a ... ⌀ 26 mm
b ... ⌀ 18 mm (suitable for Doka express anchors)

Anchoring the footplate

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



A Doka express anchor 16x125mm
B Doka coil 16mm

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

Follow Fitting Instructions!

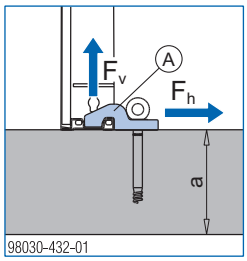
Required safe working load of alternative anchors for foot-plates:
Max. anchoring load must be in accordance with the tables in the section headed 'Structural design'.

Follow the manufacturers' applicable fitting instructions.

Anchoring the floor fixing plate

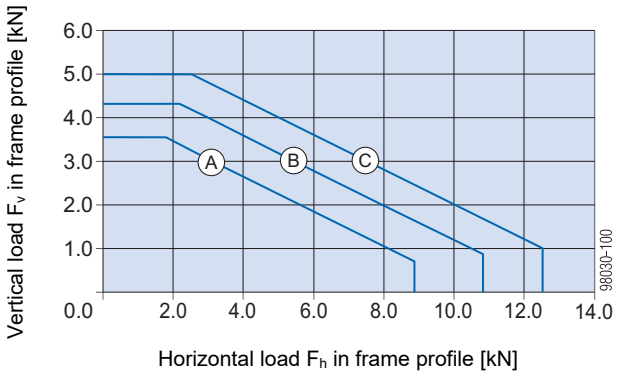
The Frami floor fixing plate is used to fix and secure framed formwork panels:

- As safeguard against lift-out by the wind.
- When panel struts are used without adjusting struts.



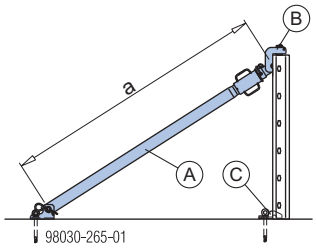
a ... min. 18 cm
Distance from outside edge of panel: min. 15 cm

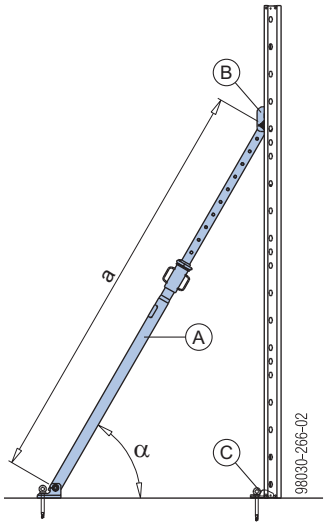
A Frami floor fixing plate



	Characteristic cube compressive strength of the concrete ($f_{ck,cube}$):	Max. anchoring load	
		F_{exist}	F_d
(A)	10 N/mm² (C8/10 grade concrete)	9.2 kN	13.8 kN
(B)	15 N/mm² (C12/15 grade concrete)	11.2 kN	16.8 kN
(C)	20 N/mm² (C16/20 grade concrete)	12.9 kN	19.4 kN

Plumbing strut 260





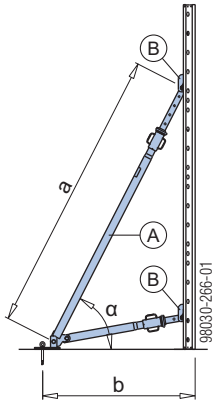
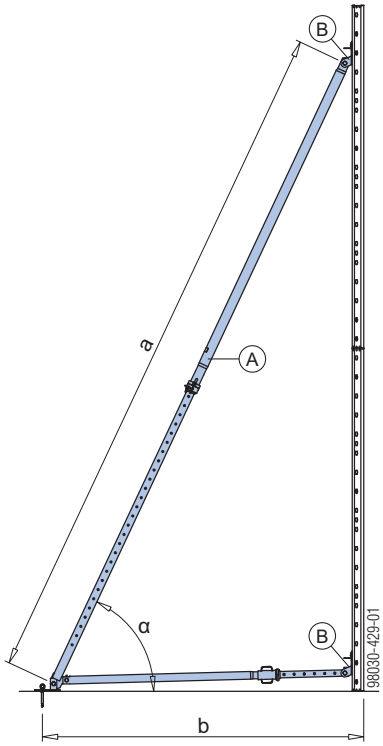
a ... min. 147 cm, max. 256 cm
α ... approx. 60°

A Plumbing strut 260 IB
B Strut head EB
C Frami floor fixing plate

Panel struts

Product features:

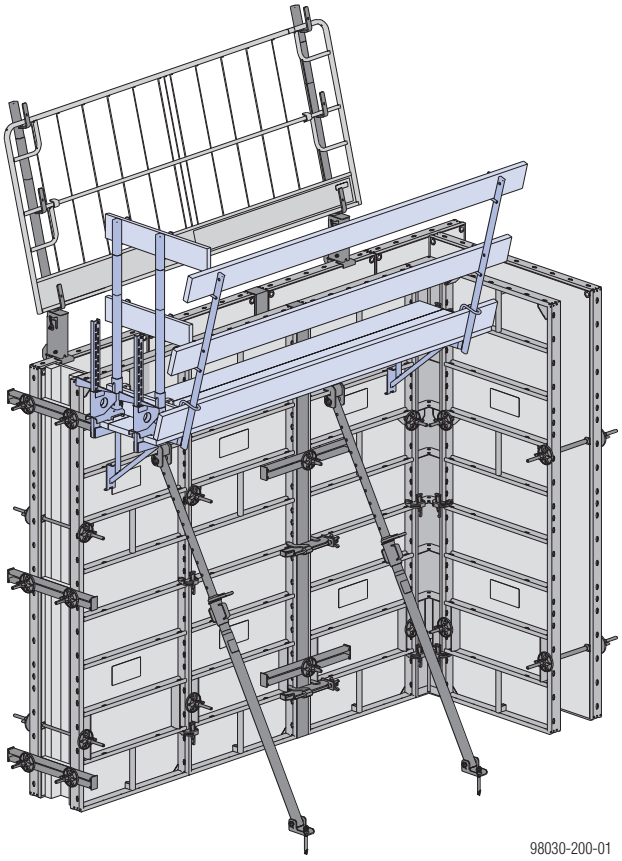
- can be extended in 8 cm increments
- Fine adjustment by screw-thread
- All parts are captive, including the telescopic tube which has a safety stop to prevent dropout

Panel strut 340	Panel strut 540
	
a ... 190.8 - 341.8 cm b ... 107.7 - 156.8 cm	a ... 310.5 - 549.2 cm b ... 204.4 - 253.0 cm

α ... approx. 60°

A Panel strut 340 IB or 540 IB
B Strut head EB, Frami prop head EB or Frami connection profile

Pouring platforms with single brackets



Preconditions for use:

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

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

Ensure that the formwork gang has sufficient stiffness.

Observe all applicable safety regulations.

NOTICE

Multi-panel gangs without an opposing formwork and with pouring platforms and Plumbing struts 260 must be fixed on the ground so that they cannot be dislodged.

This can be done in either of 2 ways:

- with Frami floor fixing plates and Doka Express anchors 16x125mm
- using Doka Express anchors 16x125mm placed through the cross boreholes of the Frami Xlife panels

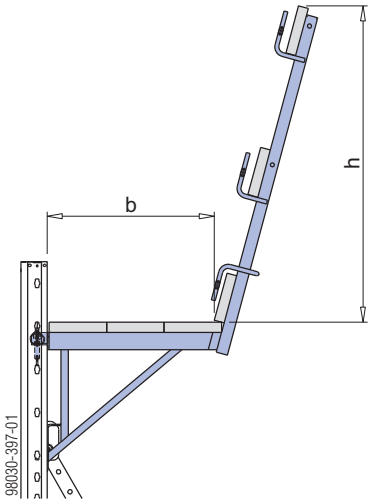
Note:

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

Observe all national regulations applying to deck-boards and guard-rail boards.

with Frami bracket 60

Frami brackets 60 are easy to assemble by hand and provide a 60 cm wide pouring platform.



b ... 58 cm
h ... 110 cm

Permitted service load: 1.5 kN/m² (150 kg/m²)
Load Class 2 to EN 12811-1:2003
Max. influence width: 1.50 m

NOTICE

The brackets must be secured against accidental lift-out.

Deck-boards and guardrail boards: Per 1 metre length of platform, 0.6 m² of deck-board and 0.6 m² of guardrail board are needed (site-provided).

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

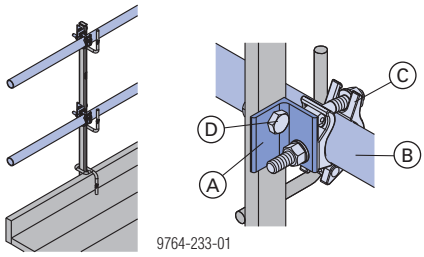
- Deck-boards min. 20/5 cm
- Guardrail boards min. 15/3 cm

Threaded-fastener material required for securing the deck-boards (fasteners per bracket):

- 3 square bolts M10x120

Fixing the guardrail board: use nails

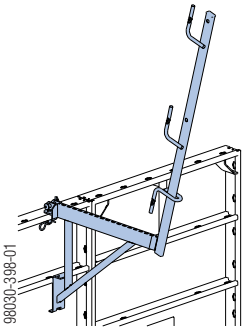
Using scaffold tubes



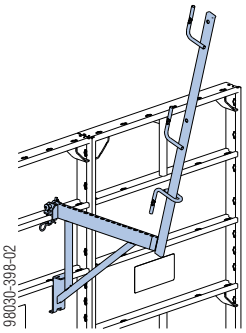
Tools required: use Fork wrench 22 for mounting the couplers and scaffold tubes.

A	Scaffold tube connection
B	Scaffold tube 48.3mm
C	Screw-on coupler 48mm 50
D	Hexagon bolt M14x40 + hexagon nut M14 (threaded-fastener material required)

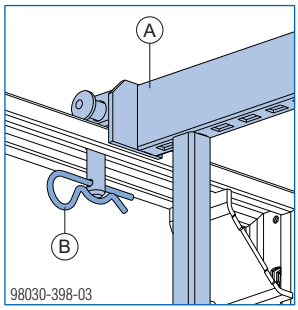
Possible ways of fixing to upright panels



In the frame profile



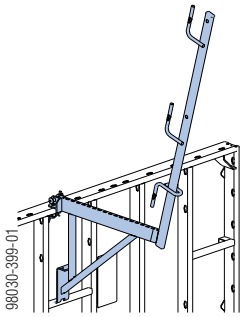
In the cross profile

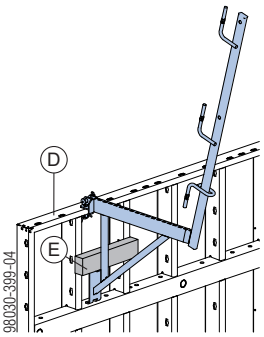


Anti-liftout guard

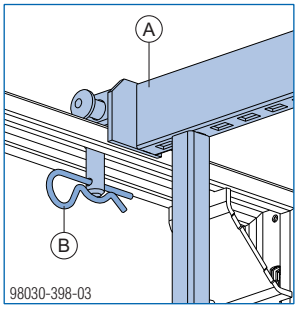
A Frami bracket 60
B Spring cotter

Possible ways of fixing to horizontally placed panels

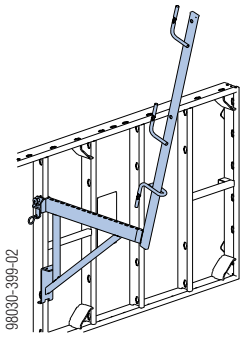




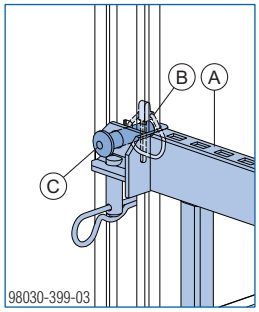
In the frame profile



Anti-liftout guard



in the cross profile *)



Anti-liftout guard

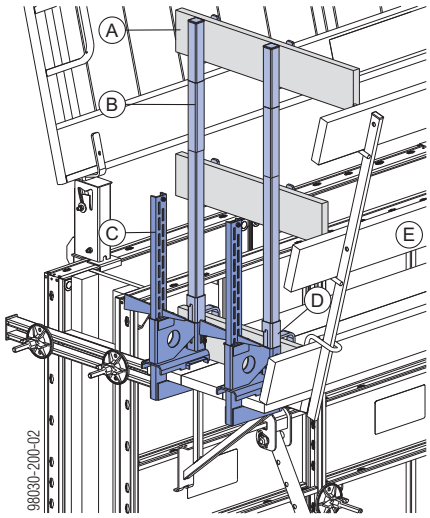
*) When the **Frami Xlife panel 2.40x2.70m** is set on its side, installation in the cross profile is not possible.

A Frami bracket 60
B Spring cotter
C Fastening pin with linch pin
D Frami Xlife panel 2.40x2.70m
E Squared timber 7.2 x 8 cm (site-provided)

Sideguards on exposed platform-ends

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

Edge protection system XP



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

How to mount:

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

Animation: https://player.vimeo.com/video/276197020

Handrail clamp S

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

Opposing guard-rail

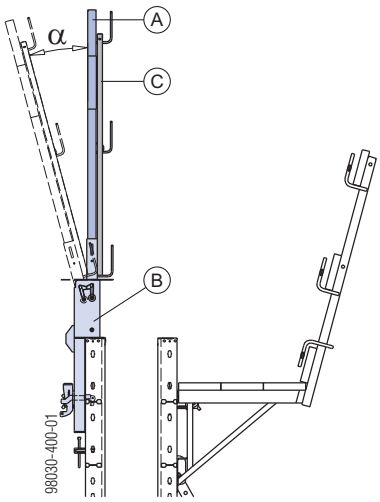
If there are work platforms mounted on one side of the formwork only, then a fall-protection barrier must be mounted to the opposing formwork.

Note:

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

Observe all national regulations applying to deck and guardrail boards.

Edge protection system XP



α ...15°

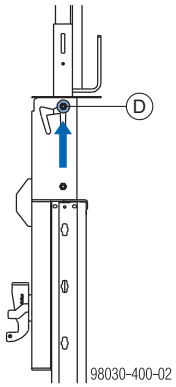
A Handrail post XP

B Frami adapter XP

C Protective grating XP or guardrail boards

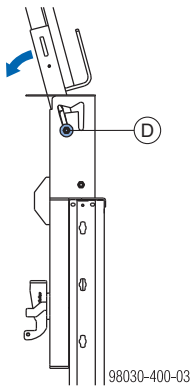
If necessary (e.g. to enlarge the available work-space during pouring), the safety barrier can be tilted outward by 15°.

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



D Safety bolt

➤ Tilt the safety barrier outward.

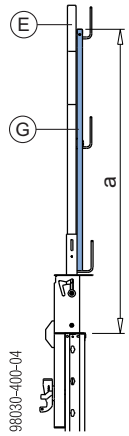
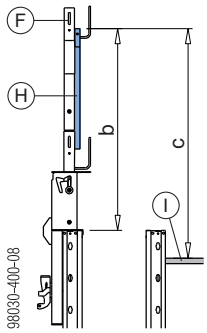
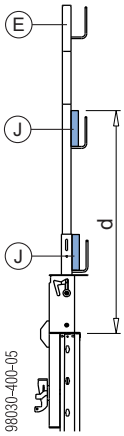


D Safety bolt

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

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

Types of safety barrier:

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

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

E Handrail post XP 1.20m

F Handrail post XP 0.60m

G Protective grating XP 1.20m

H Protective grating XP 0.60m

I Platform decking

J Guardrail board

NOTICE

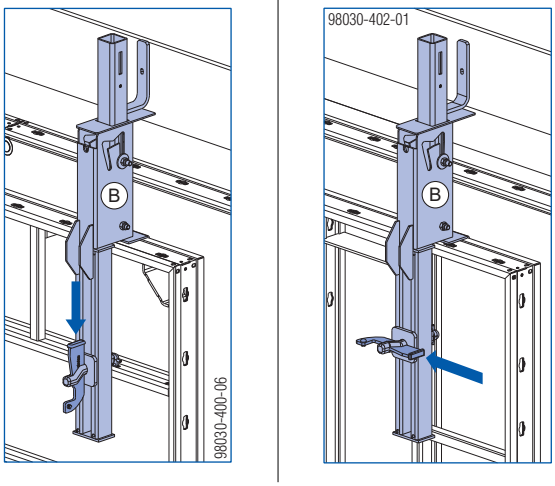
- When Protective gratings XP 0.60m are used to make the safety barrier, note the necessary minimum distance of 100 cm from platform decking to top of railing!
- When guardrail boards are used to make the safety barrier, it is not permissible to install guardrail boards in the top handrail-post plates.

Assembly

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

➤ Mount the Frami adapter XP to the Frami Xlife panel, fixing it on firmly with the wedge.

Frami panel standing upright:	Frami panel on its side *):



*) When the **Frami Xlife panel 2.40x2.70m** is set on its side, installation is not possible.

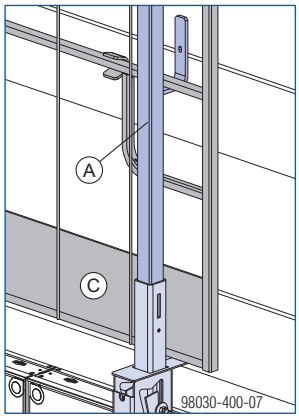
B Frami adapter XP

Make sure it is seated correctly and making full contact!

➤ Push the handrail post XP into the post-holding fixture on the Frami adapter XP until the locking mechanism engages.

➤ Fit on a Protective grating XP or guardrail boards.

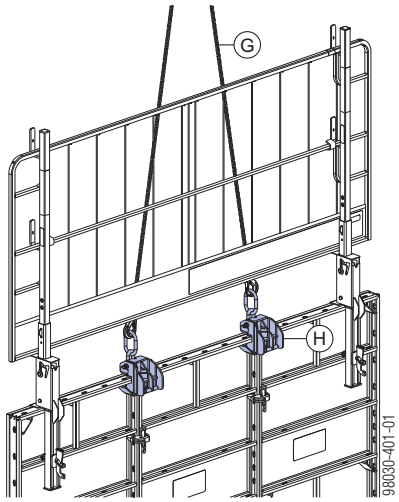
➤ Use Velcro® fasteners 30x380mm to secure the Protective gratings XP to the Handrail posts XP, or use nails (diam. 5 mm) to secure guardrail boards.



A Handrail post XP

C Protective grating or guardrail boards

Lifting by crane

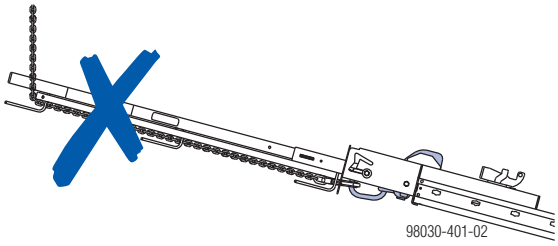


G Doka 4-part chain 3.20m

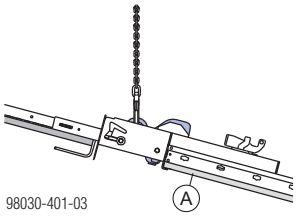
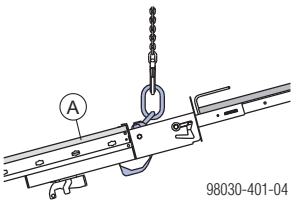
H Frami lifting hook

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

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

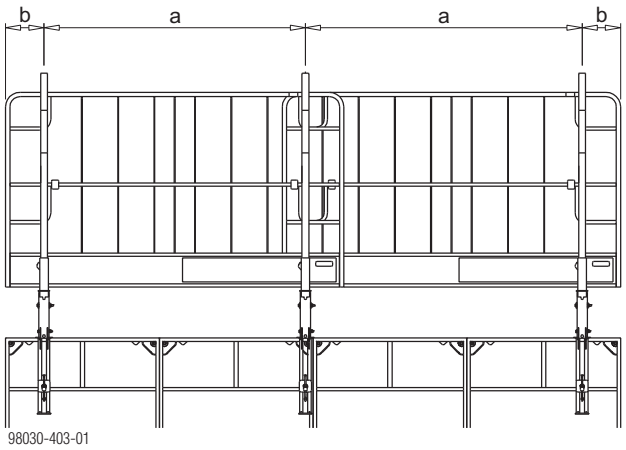


Make sure that the 4-part chain is in the right position:

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

A Form-ply side

Structural design



a ... support centres
b ... cantilever

Note:

The wind conditions likely to be encountered in Europe, in accordance with EN 13374, are largely recognised by the dynamic pressure q=0.6 kN/m² (highlighted in the tables).

Permitted support centres (a)

		Dynamic pressure q [kN/m²]			
		0.2	**0.6**	1.1	1.3
Permitted support centres	Protective grating XP	**2.5 m**			-
	Guard-rail board 2.4 x 15 cm	**1.9 m**			
	Guard-rail board 3 x 15 cm	**2.7 m**			
	Guard-rail board 4 x 15 cm	**3.3 m**			

Permitted cantilever (b)

		Dynamic pressure q [kN/m²]			
		0.2	**0.6**	1.1	1.3
Permitted cantilever	Protective grating XP	**0.6 m**		0.4 m	-
	Guard-rail board 2.4 x 15 cm	**0.5 m**			
	Guard-rail board 3 x 15 cm	**0.8 m**			
	Guard-rail board 4 x 15 cm	**1.4 m**			

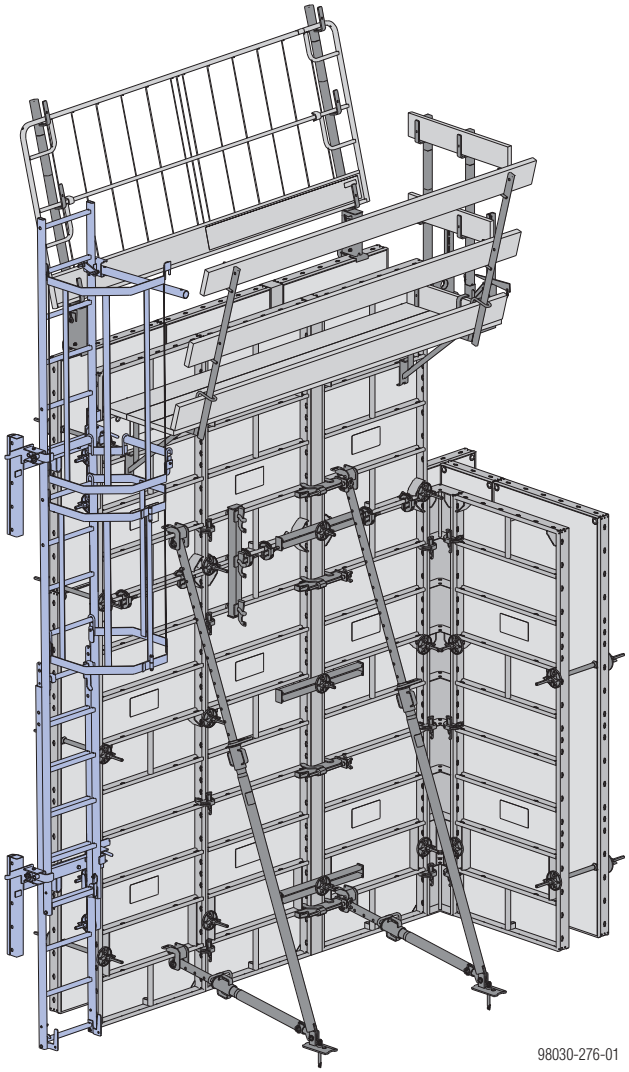
Ladder system

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

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

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

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



Shown here on Frami Xlife panels 2.70m.

Assembly

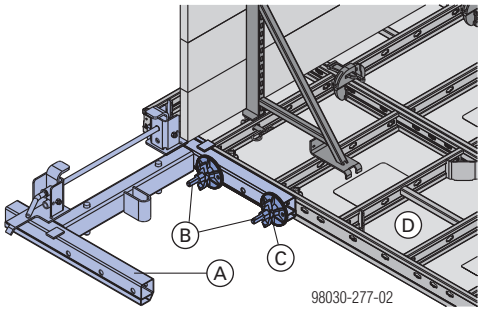
Preparing the formwork

➤ Pre-assemble the gang-forms (see the section headed 'Inter-panel connections').
➤ Mount the pouring platform and the panel struts (see the sections headed 'Plumbing accessories' and 'Pouring platforms with single brackets').

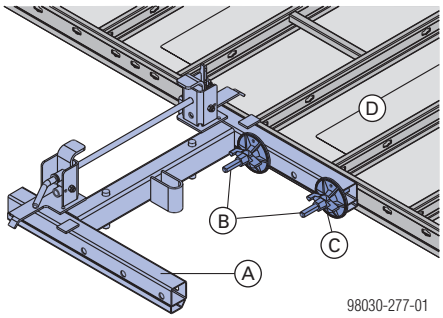
Attaching connectors to the formwork

➤ Place the Connector XS Wall formwork against the frame profile near the top of the formwork.
➤ Attach this Connector XS Wall formwork using two Frami universal fixing bolts 5-12cm and two Super-plates 15.0.
➤ Mount a Connector XS Wall formwork near the bottom of the formwork, in the same way.

Top Connector XS Wall formwork



Bottom Connector XS Wall formwork



A	Connector XS Wall formwork
B	Frami universal fixing bolt 5-12cm
C	Super-plate 15.0
D	Frami Xlife panel

Fixing the ladder

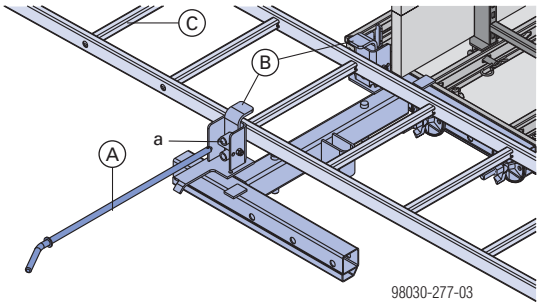
to the top Connector XS Wall formwork

➤ Pull out the push-in bolt, and pivot the two safety hooks out of the way.

➤ Place the System ladder XS 4.40m onto the Connector XS, with the hooking brackets facing downwards.

➤ Close the safety hooks.

➤ Insert the push-in bolt into whichever rung of the ladder is suitable for the height of the formwork, and secure it with a linch pin.



- in the front position (a)

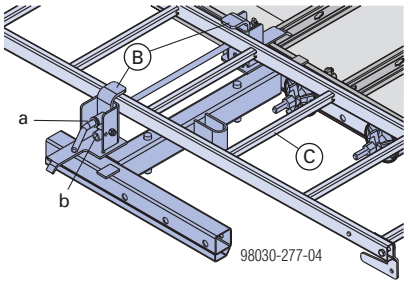
A	Push-in bolt
B	Safety hooks
C	System ladder XS 4.40m

Animation: https://player.vimeo.com/video/274425011

to the bottom Connector XS Wall formwork

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

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

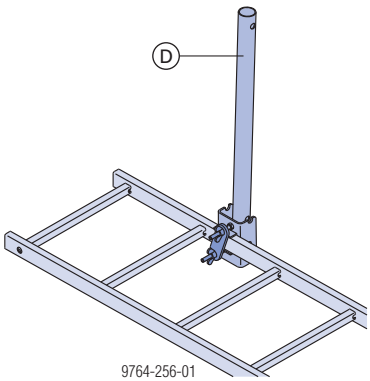


– in the front position (a) for one single ladder
– in the rear position (b) in the telescoping zone (for 2 ladders)

B	Safety hooks
C	Ladder XS

Animation: https://player.vimeo.com/video/274427263

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



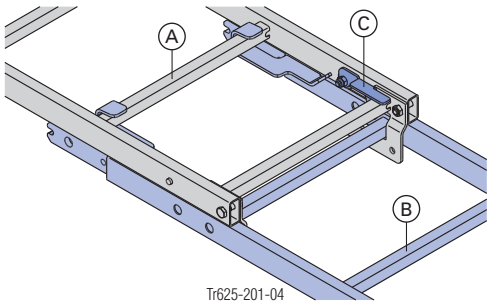
D	Securing barrier XS

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

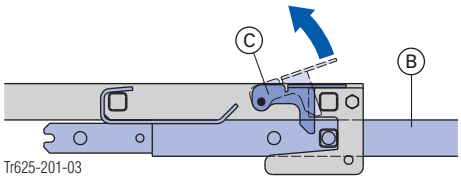
Ladder system XS for heights above 3.60 m

Telescoping ladder extension (for adjusting to ground level)

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



Close-up

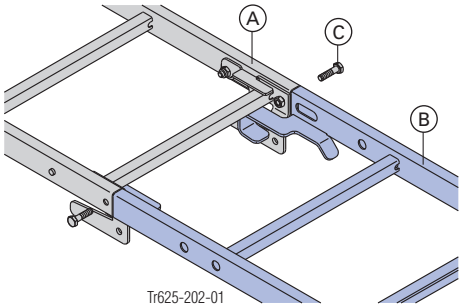


A	System ladder XS 4.40m
B	Ladder extension XS 2.30m
C	Securing latch

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

Permanently fixed ladder extension

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



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

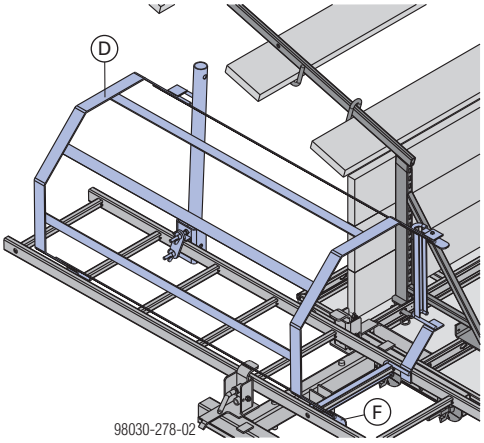
A System ladder XS 4.40m
B Ladder extension XS 2.30m
C Hexagon bolt M10x40

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

NOTICE

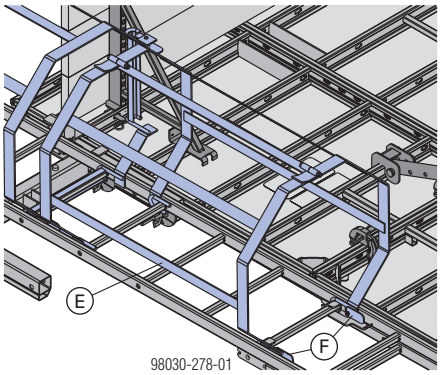
➤ Always observe all relevant safety regulations applying to the use of the Ladder cage XS in the country in which you are operating (e.g. in Germany: BGV D 36).

➤ Attach the Ladder cage exit XS (the bottom of the cage must always be at the same height as the platform). The safety latches prevent the cage from being accidentally lifted out.



D Ladder cage exit XS
F Safety latch (lift-out guard)

➤ Attach the Ladder cage XS to the next available rung. Attach further ladder cages, in each case to the next available rung.

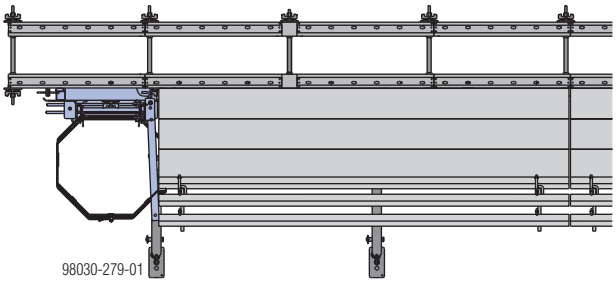


E Ladder cage XS
F Safety latches (lift-out guard)

Fixing in the cross profile

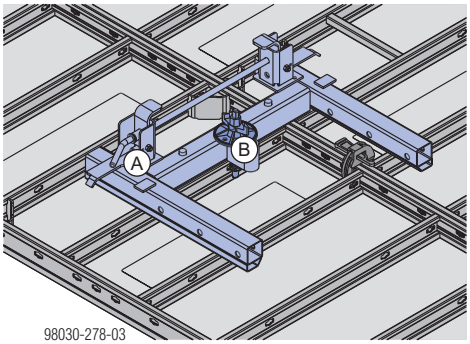
Mounting the Ladder system XS to the cross profile makes it an integral part of the gang-form.

Plan view



How to mount:

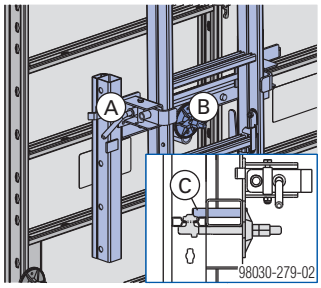
➤ Fix the Connector XS Wall formwork to the cross profile with a Frami universal fixing bolt 5-12cm and a Super-plate 15.0.



A Connector XS Wall formwork
B Frami universal fixing bolt 5-12 cm + Super-plate 15.0

Anti-slide-off protection

By resting firmly against the cross profile, two bolts prevent the Connector XS Wall formwork from accidentally sliding off.



A Connector XS Wall formwork
B Frami universal fixing bolt 5-12 cm + Super-plate 15.0
C Bolts

Items needed

Connectors + ladder	Formwork height	
	2.70-3.75 m	>3.75-6.00 m
Connector XS Wall formwork	2	2
Frami universal fixing bolt 5-12cm	4 or 2[1)]	4 or 2[1)]
Super plate 15.0	4 or 2[1)]	4 or 2[1)]
System ladder XS 4.40m	1	1
Ladder extension XS 2.30m	0	1

[1)] When connected to the cross profile

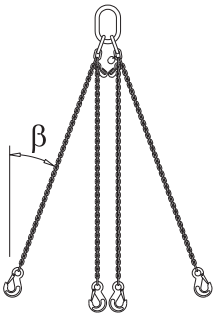
Ladder cage	Formwork height			
	2.70-3.15 m	>3.15-3.90 m	>3.90-5.40 m	>5.40-6.00 m
Ladder cage exit XS [2)]	1	1	1	1
Securing barrier XS [2)]	1	1	1	1
Ladder cage XS 1.00m [2)]	0	1	2	3

[2)] This does not take account of any intermediate exits.

Lifting by crane

Safe crane-handling of Frami Xlife is possible using the **Frami lifting hook** and the **Doka 4-part chain 3.20m**. The lifting hook locks automatically after being hung into place.

Doka 4-part chain 3.20m



CE

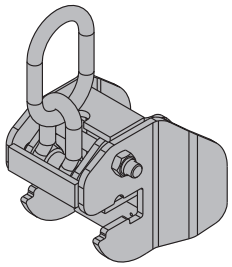
➤ Attach the Doka 4-part chain 3.20m to the Frami lifting hooks.

➤ Hang the remaining chain-lengths back in place.

Max. load (as 2-part chain):
Up to spread-angle of 30° β 2400 kg.

Follow the directions in the Operating Instructions!

Frami lifting hook



CE

Max. load:

- Spread angle β up to 30°:
  500 kg (1100 lbs) / Frami lifting hook
- Spread angle β up to 7.5°:
  750 kg (1650 lbs) / Frami lifting hook

Frami lifting hooks with load-bearing capacity of 500 kg (1100 lbs) max. also meet the requirements for a load-bearing capacity of 750 kg (1650 lbs) max. using a spread angle β of ≤ 7.5°.

Follow the directions in the Operating Instructions!

Securing the lifting hooks against sliding from side to side

NOTICE

Position the lifting hooks so that they are secured against sideways slippage.

- over **inter-panel joints**
- over **cross profiles** (single panel installed on its side)
- over **handles**

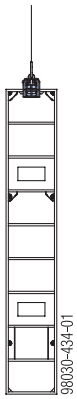
For other suitable positions see the section headed 'Position of the lifting hooks'.

Position of the lifting hooks

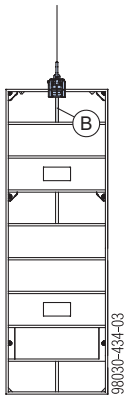
Note:
The positions of the lifting hooks shown here also apply for vertically stacked gang-forms.

Single panel:

Panels up to 0.45m wide

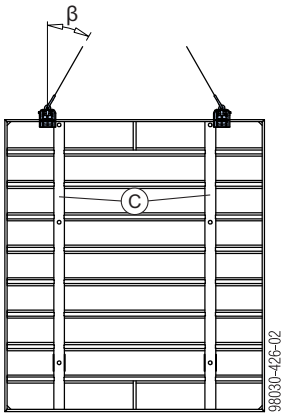


Panels more than 0.45m wide



B Handle

Panel 2.40x2.70m

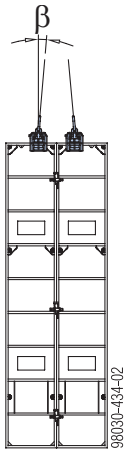


Position each lifting hook at the outside of a centre profile to prevent the hook sliding from side to side.

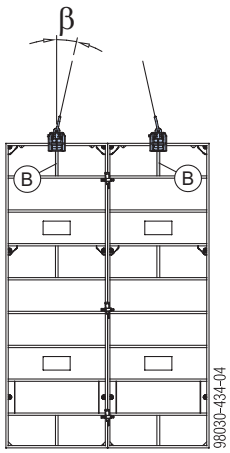
C Centre profile

Gang-form - two panels upright:

Panel widths up to 0.45m

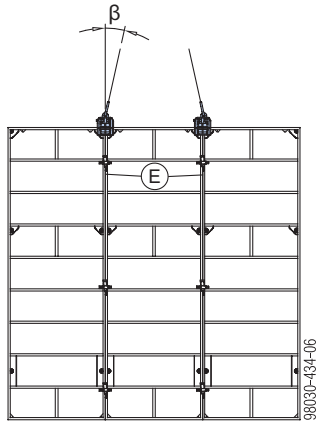


Panel widths more than 0.45m



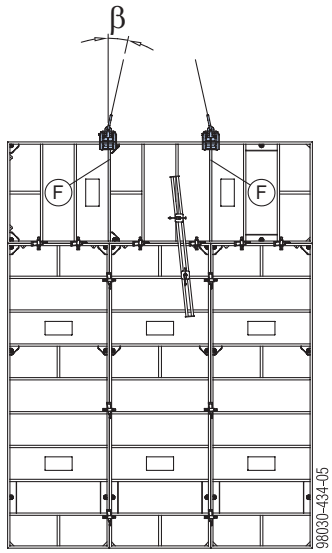
B Handle

Gang-form - three (or more) panels upright:



E Panel joint

Gang-form - panel on its side (vertically stacked):

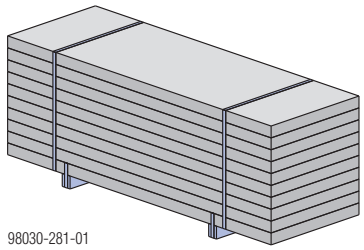


F Cross profile

Transporting, stacking and storing

Bundling the panels

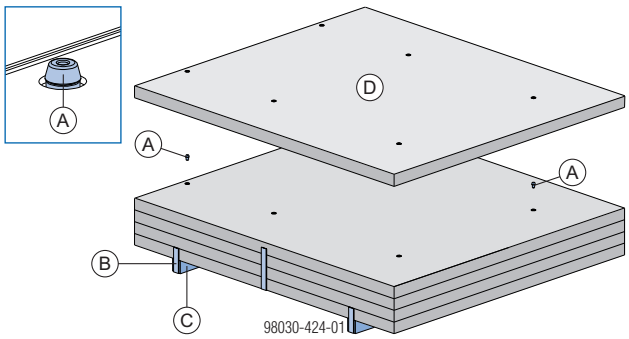
- ➤ Position sleepers measuring approx. 8.0 x 10.0 (W x H) underneath the cross profile.
- ➤ Strap the sleepers (hardwood blocking) and the bottom panel together with strapping tape.
- ➤ Strap the whole stack together tightly with strapping tape.



Stacking Frami Xlife panels 2.40x2.70m:

WARNING
The smooth surface of the **Frami Xlife panels 2.40x2.70m** reduces the sticking friction.
- ➤ It is strictly forbidden to lift stacks of Frami Xlife panels 2.40x2.70m without inserting Frami stacking cones (2 cones per layer) first!

- ➤ Insert Frami stacking cones.



A	Frami stacking cone
B	Strapping tape
C	Sleeper
D	Frami Xlife panel 2.40x2.70m

The stacking cones stop the panels slipping.
- ➤ Strap the whole stack together tightly with strapping tape.

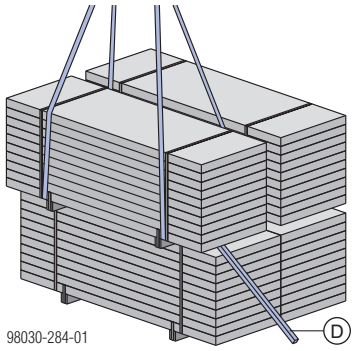
Max. number of panels in a stack:

Panel (width)	Max. number of panels stacked on top of one another	Stacking height incl. sleepers
up to 0.90m	10	approx. 100 cm
2.40x2.70m	5	approx. 60 cm

Transporting the panels

Dokamatic lifting strap 13.00m

The Lifting strap 13.00m is a practical tool for **loading and offloading lorries (trucks)**, and for **lifting and setting down stacks of panels**.



With closely stacked bundles of panels:
- ➤ lever-up the bundle of panels (e.g. with a squared timber **(D)**), to make a space for threading in the slings.

Caution!
When doing this, always make sure that the bundle of panels remains stable!

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

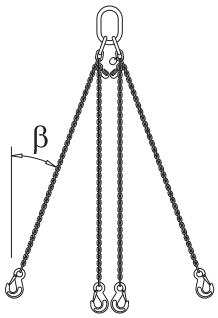
Max. load: 2000 kg

Follow the directions in the Operating Instructions!

Doka 4-part chain 3.20m

The Doka-4-part chain 3.20m is a multi-functional slinging means:

- used with the integrated **eye-hooks** for hoisting formwork, platforms and multi-trip packaging containers
- used in conjunction with the **Frami transport hook** for hoisting stacks of panels and individual panels



The Doka 4-part chain 3.20m can be adjusted to the centre-of-gravity position by shortening the lengths of the individual chains.

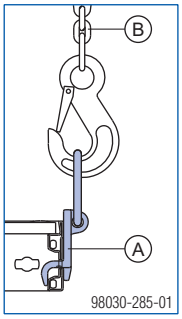
Max. load P_{max}:

	Spread-angle β			
	0°	0°-30°	30°-45°	45°-60°
Using 1 chain	1400 kg	-	-	-
Using 2 chains	-	2400 kg	2000 kg	1400 kg
Using all 4 chains	-	3600 kg	3000 kg	2120 kg

Follow the directions in the Operating Instructions!

Frami transport hook with Doka 4-part chain 3.20m

Close-up of Frami transport hook



A Frami transport hook
B Doka 4-part chain 3.20m
C Stacking tape
D Strapping tape

Max. load:
450 kg / Frami transport hook

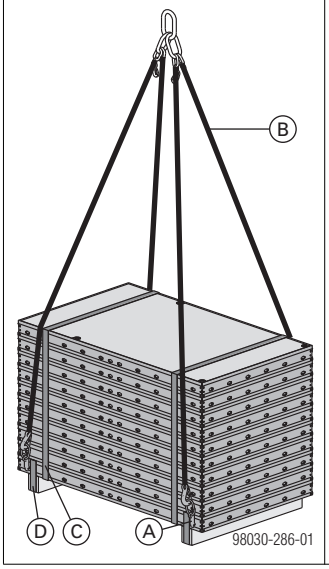
Frami transport hooks manufactured before 2015, with a load capacity of 250 kg, are capable of carrying 450 kg.

Follow the directions in the Operating Instructions!

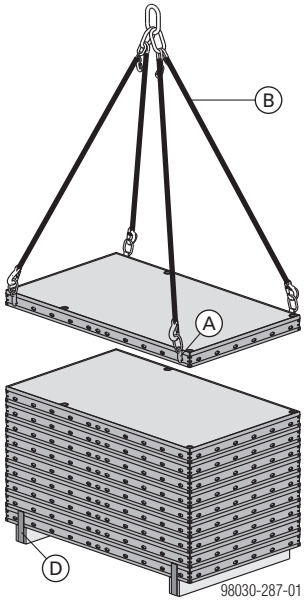
The Frami transport hook plus Doka 4-part chain 3.20m are used for:

- Lifting a bundled stack of panels
- Lifting panels off the stack
- Lifting horizontal (flat) multi-panel gangs

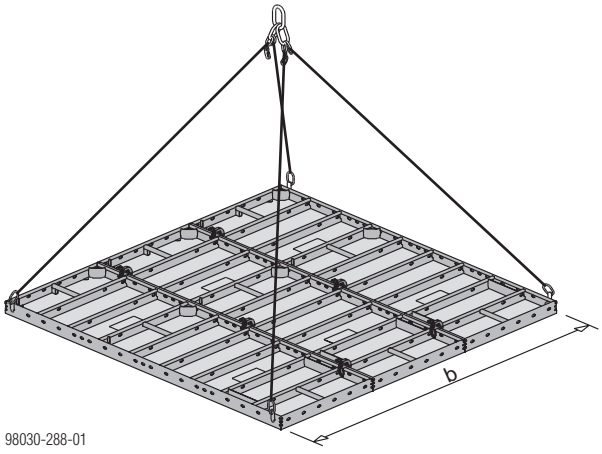
Lifting a bundled stack of panels



Lifting panels off the stack



Lifting horizontal (flat) multi-panel gangs

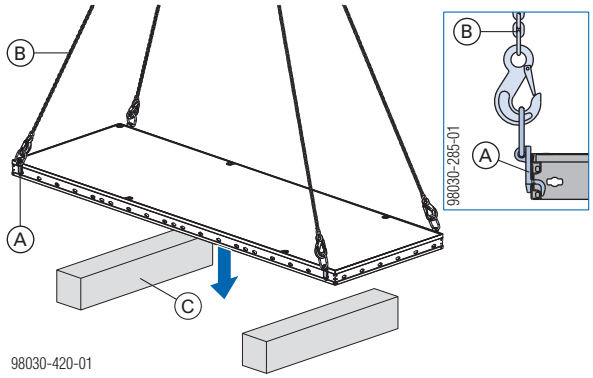


Shown here on Frami Xlife panels 2.70m.

Dimension 'b' (width of the gang-form)	Max. n° of panels across the width of the gang-form
up to 1.80 m	no limitation
more than 1.80 m	**max. 3 panels**

Lifting panels upright / turning panels over

➤ Use **Frami transport hooks** to lay the framed panel flat on squared timbers 20x20 cm.



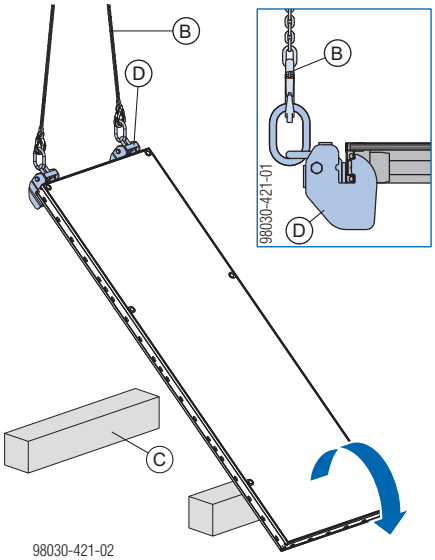
A	Frami transport hook
B	Doka 4-part chain 3.20m
C	Squared timber 20x20 cm

WARNING

Using Frami transport hooks to lift the framed elements upright or turn them over is prohibited!

➤ Use Frami lifting hooks!

➤ Position the Frami lifting hooks. Lift the framed panel upright with **Frami lifting hooks** and, if applicable, lay flat with the sheeting side down.



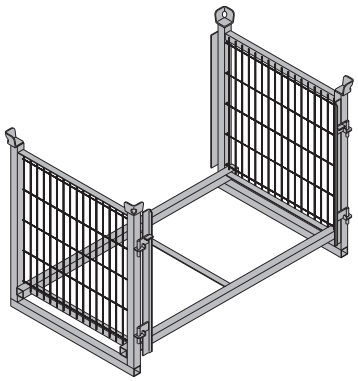
B	Doka 4-part chain 3.20m
C	Squared timber 20x20 cm
D	Frami lifting hook

Follow the directions in the Operating Instructions!

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

Frami pallets 1.20m and 1.50m

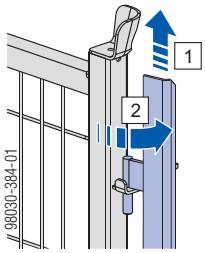
Storage and transport device for Frami articles with system height 1.20 or 1.50m



Max. carrying capacity: 800 kg
Permitted imposed load: 3500 kg

Loading the pallets (from the side)

1) Lift the left and right side hinges.
2) Turn the side hinges to one side.



3) Load the pallets.
4) Lift the left and right side hinges and close them.

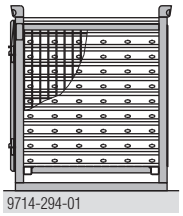
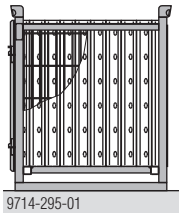
Both side hinges must be locked in place

Using Frami pallets as storage units

Max. n° of units on top of one another

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

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

Panels laid flat	Panels stood upright	Mixed orientation
		
9714-294-01	9714-295-01	9714-296-01

Width of Frami panels	Max. n° of panels that can be loaded
0.90m	10
0.75m	11
0.60m	13
0.45m	20
0.30m	30

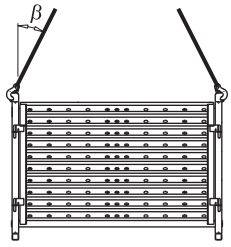
Using Frami pallets as transport devices

Lifting by crane

➤ Before attaching the lifting chain, check that:

Both side hinges must be locked in place

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



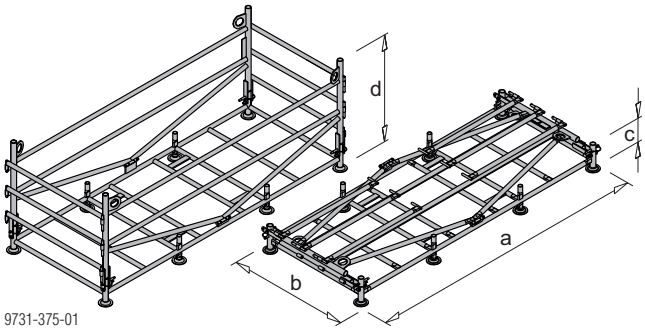
98030-383-01

Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under the broadside of the containers.

Alu-Framax pallet

Storage unit and transport container, foldable and stackable, for Frami panels 2.70m.



a ... 280 cm
b ... 117 cm
c ... 26 cm
d ... 107 cm

Max. carrying capacity: 1200 kg
Permitted imposed load: 5200 kg

Using Alu-Framax pallets as storage units

Max. n° of units on top of one another

Outdoors (on the site)	Indoors Floor gradients up to 1%
Neither empty (unfolded) pallets nor full ones are allowed	6

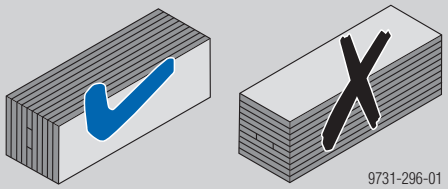
NOTICE

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

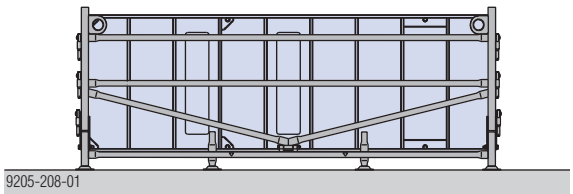
WARNING

If panels were stacked flat, they might slip out of the pallet (between the horizontal braces) when in transit!

➤ Only stack panels **in the upright**!



Used for 2.70 m high Frami panels



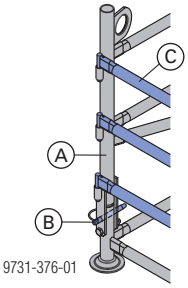
Panel	N° of panels
0.90x2.70m	10
0.30x2.70m	30

Using Alu-Framax pallets as transport devices

Lifting by crane

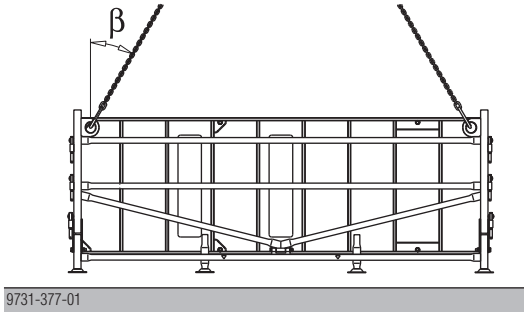
➤ Before attaching the lifting chain, check that:

- the vertical profile **(A)** must be secured with a Spring locked connecting pin 16mm **(B)**
- all bolt-in tubes **(C)** must be bolted onto the vertical profile **(A)** – pallet closed!



NOTICE

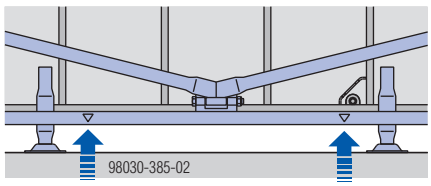
- Multi-trip packaging items must be lifted individually.
- Secure the load in part-loaded pallets!
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread angle β max. 30°!



Repositioning by forklift truck or pallet stacking truck

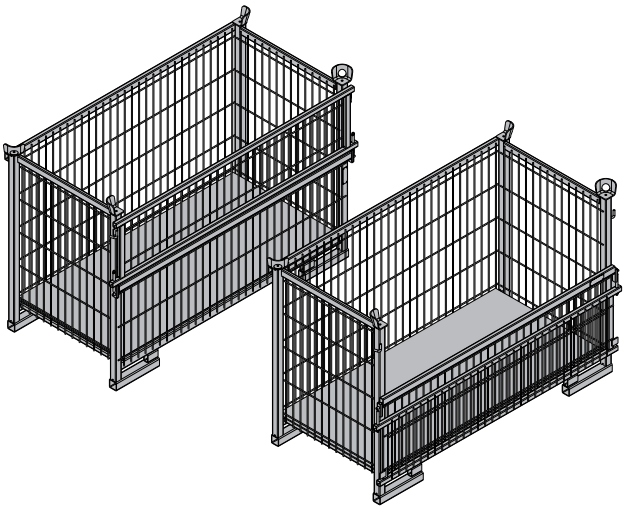
NOTICE

The forks of the stacker truck may only be placed beneath the marked points **(yellow marking)**!



Doka skeleton transport box 1.70x0.80m

Storage and transport device for small items



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

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

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

Max. n° of units on top of one another

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

NOTICE

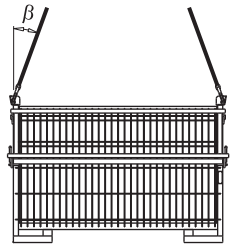
Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

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

Lifting by crane

NOTICE

- Multi-trip packaging items may only be lifted one at a time.
- Only lift the boxes when their sidewalls are closed!
- Use a suitable crane suspension tackle (e.g. Doka 4-part chain 3.20m).
  Do not exceed the permitted load-bearing capacity.
- Spread angle β max. 30°!



9234-203-01

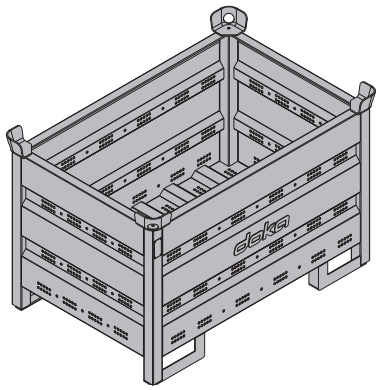
Repositioning by forklift truck or pallet stacking truck

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

Doka multi-trip transport box

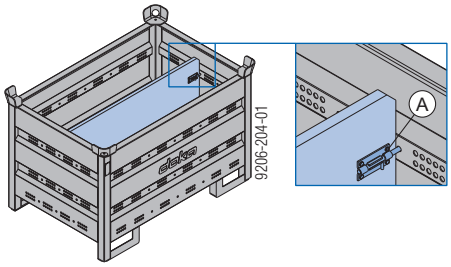
Storage and transport device for small items

Doka multi-trip transport box 1.20x0.80m



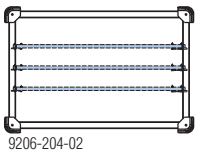
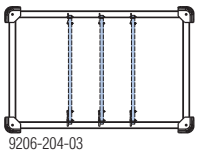
Max. carrying capacity: 1500 kg (3300 lbs)
Permitted imposed load: 7850 kg (17300 lbs)

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

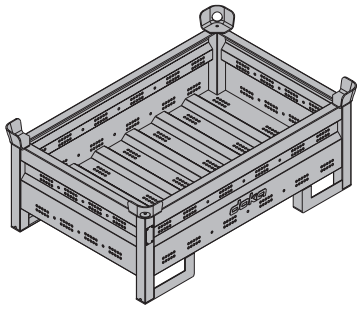


A Slide-bolt for fixing the partition

Possible ways of dividing the box

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

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



Max. carrying capacity: 750 kg (1650 lbs)
Permitted imposed load: 7200 kg (15870 lbs)

Using Doka multi-trip transport boxes as storage units

Max. n° of units on top of one another

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

NOTICE

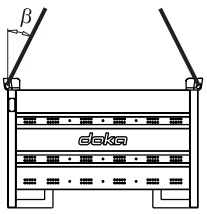
Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

NOTICE

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



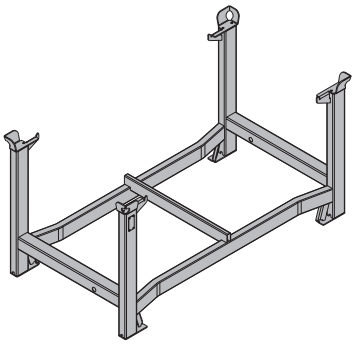
9206-202-01

Repositioning by forklift truck or pallet stacking truck

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

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

Storage and transport devices for long items.



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

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

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

NOTICE

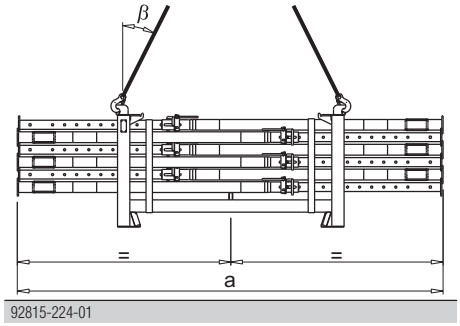
- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- **How to use with Bolt-on castor set B:**
  - Always apply the fixing brake when the container is 'parked'.
  - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with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

Using Doka stacking pallets as transport devices

Lifting by crane

NOTICE

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



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

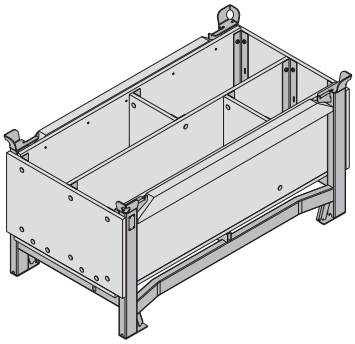
Repositioning by forklift truck or pallet stacking truck

NOTICE

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

Doka accessory box

Storage and transport device for small items



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

Doka accessory boxes as storage units

Max. n° of units on top of one another

Outdoors (on the site)	Indoors
Floor gradients up to 3%	Floor gradients up to 1%
3	6
It is not allowed to stack empty pallets on top of one another!	

NOTICE

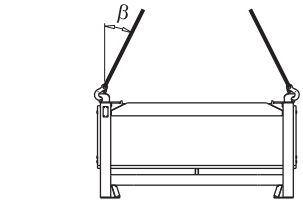
- Stacked multi-trip boxes or pallets must have the heaviest boxes at the bottom and the lightest at the top.
- **How to use with Bolt-on castor set B:**
  - Always apply the fixing brake when the container is 'parked'.
  - When Doka stacking pallets are stacked, the bottom pallet must NOT be one with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

Doka accessory box as transport devices

Lifting by crane

NOTICE

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



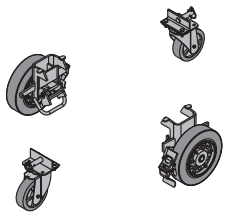
92816-206-01

Repositioning by forklift truck or pallet stacking truck

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

Bolt-on castor set B

The Bolt-on caster set B turns the stacking pallet into a fast and manoeuvrable transport device.
Suitable for drive-through access openings > 90 cm.



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

- Doka accessory box
- Doka stacking pallets

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

General

Using as downturned-beam formwork

Using **tie-holder brackets** for the **top and bottom ties** has the following effects:

- The tie-points are above/below the panel – no ties in the concrete
- Form-tie spacings are freely selectable

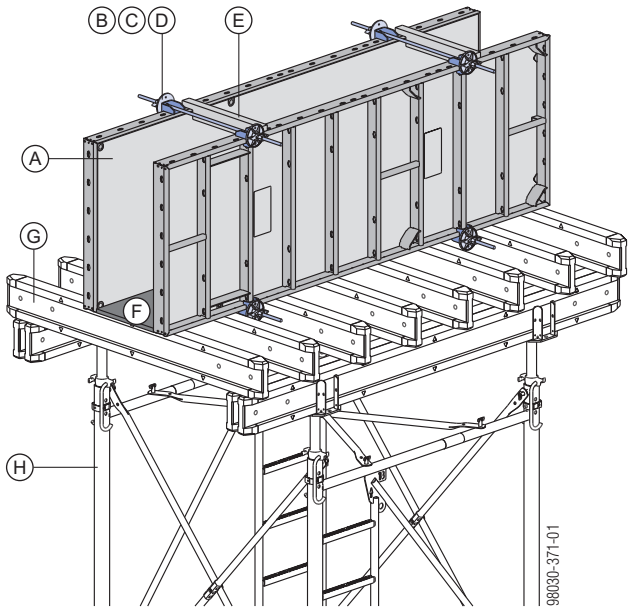
Required numbers of Frami tie-holder brackets:

Frami Xlife panel (horizontal)	Number of Frami tie-holder brackets	
	At top	**At bottom**
1.20m	2 / 1 *)	2 / 1 *)
1.50m	2 / 1 *)	2 / 1 *)
2.70m	2	2
3.00m	2	2
Downturned beam height: max. 90 cm		

*) In every other panel, only one Frami tie-holder bracket is needed. Two Frami tie-holder brackets are needed in the first panel, and two in the last panel.

Frami tie-holder bracket:
Permitted capacity: 10 kN

Example with 0.90x2.70m panel

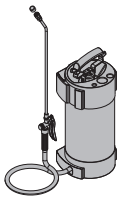


A	Frami Xlife panel 0.90x2.70m
B	Frami tie-holder bracket
C	Tie-rod 15.0mm
D	Super-plate 15.0
E	Wooden spacer
F	Formwork sheet
G	Doka beam H20
H	Load-bearing tower (e.g. Staxo 100)

Cleaning and care of your equipment

Release agents

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



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

NOTICE

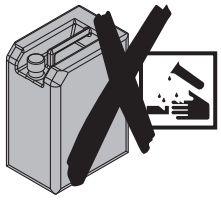
- Before every pour:
  - Apply release agent to the formwork sheet and the end faces **extremely thinly**, **evenly** and **in a continuous layer**.
- Make sure there are no drips of release-agent running down the formwork sheet.
- Applying too much release agent will spoil the concrete finish.

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

Cleaning

NOTICE

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

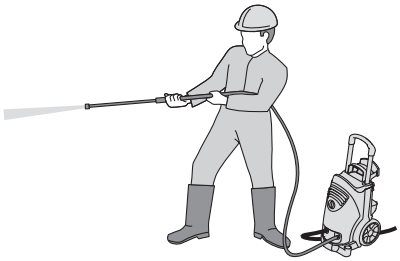


Cleaning high formwork:
Provide a service tower at a suitable cleaning location.

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

Cleaning equipment

High-pressure spray cleaner

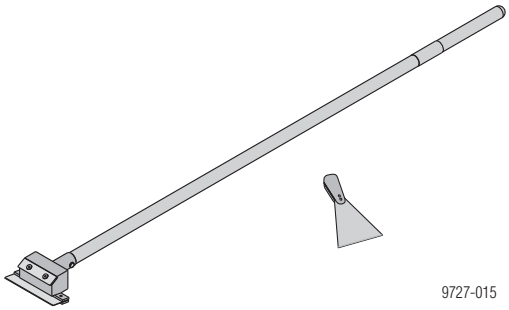


NOTICE

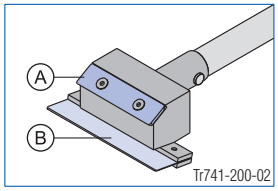
- Appliance pressure rating: 200 to max. 300 bar
- Keep the water-jet the correct distance from the formwork, and move it at the right speed:
  - The higher the pressure, the further away from the formwork you must keep the jet and the faster you must move it across the surface.
- Do not aim the jet at one place for too long.
- Make only moderate use of the jet around the silicone sealing strip:
  - If the pressure is too high, this will damage the silicone sealing strip.
  - Do not aim the jet at one place for too long.

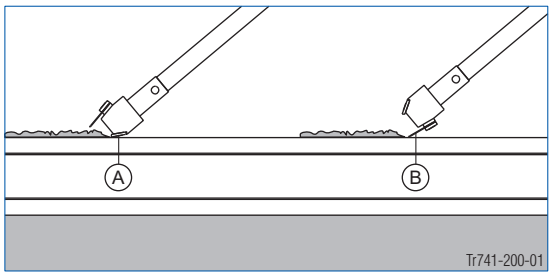
Concrete scraper

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



Functional description:

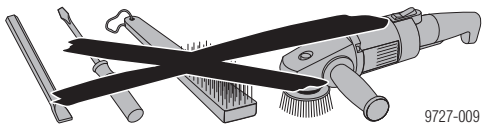




A Blade for dealing with heavy soiling
B Blade for dealing with slight soiling

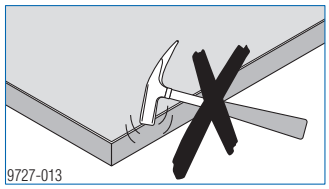
NOTICE

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

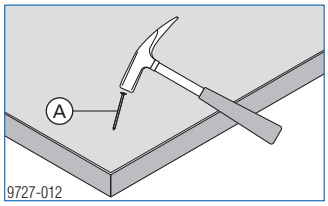


Care

- No hammer-blows to the frame profiles

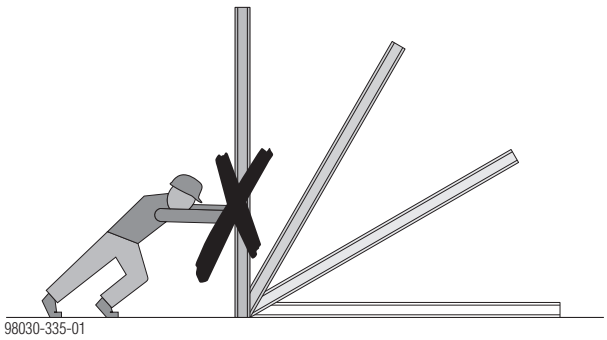


- Do not use nails on the formwork that are longer than 60 mm

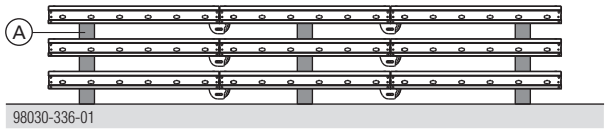


A max. l=60 mm

- Never push over panels or allow them to fall



- Always insert suitable, correctly aligned timber battens **(A)** as spacers when stacking gang-forms one on top of another.

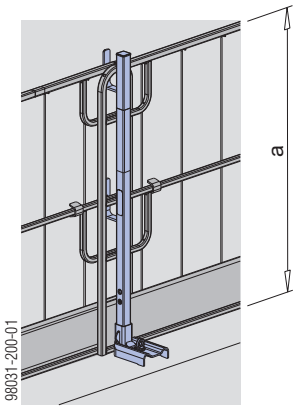


This prevents the formwork sheets from being damaged by the connector components.

Fall-arrest systems on the structure

Handrail post XP 1.20m

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

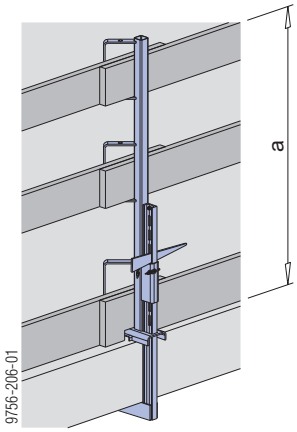


a ... > 1.00 m

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

Handrail clamp S

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

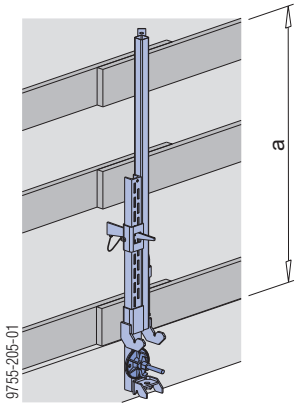


a ... > 1.00 m

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

Handrail clamp T

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

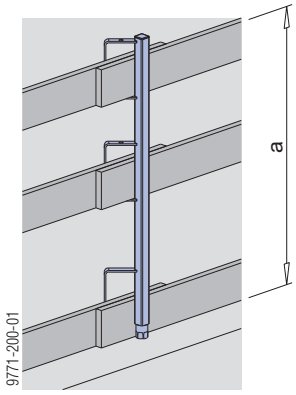


a ... > 1.00 m

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

Handrail post 1.10m

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



a ... > 1.00 m

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

	[kg]	Article N°
Frami eco panel 0.30x1.20m	**18.5**	**589405000**
Frami eco panel 0.45x1.20m	**23.5**	**589404000**
Frami eco panel 0.60x1.20m	**27.8**	**589403000**
Frami eco panel 0.75x1.20m	**32.0**	**589402000**
Frami eco panel 0.90x1.20m	**36.8**	**589401000**
Frami eco panel 0.30x2.70m	**37.2**	**589415000**
Frami eco panel 0.45x2.70m	**45.5**	**589414000**
Frami eco panel 0.60x2.70m	**56.8**	**589413000**
Frami eco panel 0.75x2.70m	**64.9**	**589412000**
Frami eco panel 0.90x2.70m	**72.7**	**589411000**
Frami eco panel 0.30x3.00m	**42.5**	**589420000**
Frami eco panel 0.45x3.00m	**51.7**	**589419000**
Frami eco panel 0.60x3.00m	**63.0**	**589418000**
Frami eco panel 0.75x3.00m	**70.3**	**589417000**
Frami eco panel 0.90x3.00m	**82.0**	**589416000**

Frami eco-Element

Painted yellow

Custom sizes on enquiry!

Frami eco universal panel 0.75x1.20m	**36.0**	**589421000**
Frami eco universal panel 0.75x2.70m	**77.8**	**589423000**
Frami eco universal panel 0.75x3.00m	**86.6**	**589424000**

Frami eco-Uni-Element

Painted yellow

Frami eco inside corner 1.20m 20cm	**24.6**	**589429000**
Frami eco inside corner 2.70m 20cm	**49.5**	**589431000**
Frami eco inside corner 3.00m 20cm	**55.6**	**589432000**

Frami eco-Innenecke

Painted yellow

Frami eco outside corner 1.20m	**10.5**	**589433000**
Frami eco outside corner 2.70m	**23.0**	**589435000**
Frami eco outside corner 3.00m	**25.3**	**589436000**

Frami eco-Außenecke

Painted yellow

	[kg]	Article N°
Frami Xlife panel 0.90x1.20m	**39.0**	**588401500**
Frami Xlife panel 0.75x1.20m	**33.5**	**588447500**
Frami Xlife panel 0.60x1.20m	**29.5**	**588463500**
Frami Xlife panel 0.45x1.20m	**24.0**	**588404500**
Frami Xlife panel 0.30x1.20m	**19.5**	**588405500**
Frami Xlife panel 0.90x1.50m	**46.5**	**588406500**
Frami Xlife panel 0.75x1.50m	**41.3**	**588448500**
Frami Xlife panel 0.60x1.50m	**35.5**	**588464500**
Frami Xlife panel 0.45x1.50m	**28.9**	**588409500**
Frami Xlife panel 0.30x1.50m	**24.8**	**588410500**
Frami Xlife panel 0.90x2.70m	**79.2**	**588481500**
Frami Xlife panel 0.75x2.70m	**69.5**	**588449500**
Frami Xlife panel 0.60x2.70m	**60.5**	**588465500**
Frami Xlife panel 0.45x2.70m	**49.5**	**588482500**
Frami Xlife panel 0.30x2.70m	**38.5**	**588483500**
Frami Xlife panel 0.90x3.00m	**86.5**	**588411500**
Frami Xlife panel 0.75x3.00m	**76.5**	**588412500**
Frami Xlife panel 0.60x3.00m	**65.0**	**588413500**
Frami Xlife panel 0.45x3.00m	**54.3**	**588414500**
Frami Xlife panel 0.30x3.00m	**45.0**	**588415500**

Frami Xlife-Element

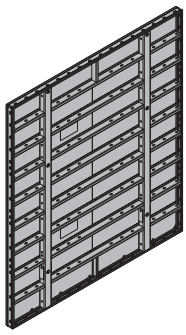
Galvanised

Custom sizes on enquiry!

Frami Xlife panel 2.40x2.70m	**263.0**	**589442500**

Frami Xlife-Element 2,40x2,70m

Galvanised



Frami Xlife universal panel 0.75x0.60m	**22.0**	**588469500**
Frami Xlife universal panel 0.75x1.20m	**39.0**	**588402500**
Frami Xlife universal panel 0.75x1.50m	**49.5**	**588407500**
Frami Xlife universal panel 0.75x2.70m	**83.5**	**588484500**
Frami Xlife universal panel 0.75x3.00m	**93.0**	**588416500**

Frami Xlife-Uni-Element 0,75m

Galvanised

	[kg]	Article N°
Frami Xlife universal panel 0.90x0.60m	**25.4**	**588470500**
Frami Xlife universal panel 0.90x1.20m	**49.0**	**588423500**
Frami Xlife universal panel 0.90x1.50m	**61.0**	**588424500**
Frami Xlife universal panel 0.90x2.70m	**106.4**	**588427500**
Frami Xlife universal panel 0.90x3.00m	**117.5**	**588428500**
Frami Xlife-Uni-Element 0,90m		
Galvanised		

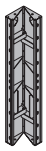
Frami Xlife pilaster panel 1.20m	**42.7**	**588450000**
Frami Xlife pilaster panel 1.50m	**51.0**	**588432000**
Frami Xlife pilaster panel 3.00m	**96.6**	**588431000**
Frami Xlife-Stützenvorlageelement		
Galvanised		

Frami inside corner 1.20m 20cm	**25.3**	**588471000**
Frami inside corner 1.50m 20cm	**30.7**	**588472000**
Frami inside corner 2.70m 20cm	**51.6**	**588485000**
Frami inside corner 3.00m 20cm	**57.4**	**588417000**
Frami-Innenecke		
Galvanised		

Frami outside corner 1.20m	**11.0**	**588459000**
Frami outside corner 1.50m	**12.9**	**588460000**
Frami outside corner 2.70m	**23.8**	**588461000**
Frami outside corner 3.00m	**25.0**	**588418000**
Frami-Außenecke		
Galvanised		

Frami hinged inside corner l galv. 1.20m	**34.1**	**588425500**
Frami hinged inside corner l galv. 1.50m	**40.8**	**588426500**
Frami-Scharnierecke l verzinkt		
Galvanised		

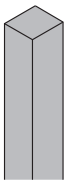
	[kg]	Article N°
Frami hinged inside corner l 1.20m	**33.5**	**588425000**
Frami hinged inside corner l 1.50m	**40.0**	**588426000**
Frami-Scharnierecke l		
Powder-coated blue		



Frami hinged outside corner A galv. 1.20m	**12.9**	**588419000**
Frami hinged outside corner A galv. 1.50m	**16.0**	**588420000**
Frami-Scharnierecke A verzinkt		
Galvanised		

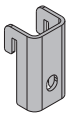
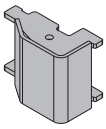
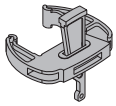
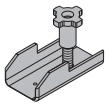
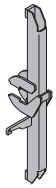
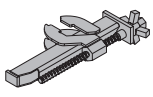
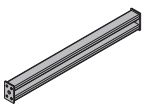
Frami hinged outside corner A 1.20m	**12.8**	**588429000**
Frami hinged outside corner A 1.50m	**15.9**	**588430000**
Frami-Scharnierecke A		
Powder-coated blue		

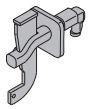
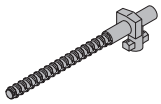
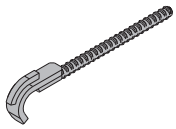
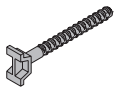
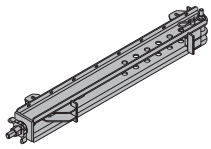
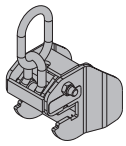
Frami fitting timber 10x9cm 1.50m	**6.0**	**176035000**
Frami fitting timber 5x9cm 1.50m	**3.0**	**176034000**
Frami fitting timber 3x9cm 1.50m	**1.9**	**176033000**
Frami fitting timber 2x9cm 1.50m	**1.2**	**176032000**
Frami fitting timber 10x9cm 2.70m	**12.3**	**176083000**
Frami fitting timber 5x9cm 2.70m	**6.1**	**176082000**
Frami fitting timber 3x9cm 2.70m	**3.7**	**176081000**
Frami fitting timber 2x9cm 2.70m	**2.5**	**176080000**
Frami-Passholz		
Varnished yellow		



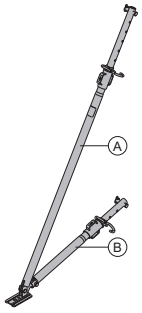
Frami plywood support 27mm	**2.0**	**588473000**
Frami plywood support 21mm	**2.1**	**588474000**
Frami plywood support 18mm	**2.2**	**588499000**
Frami-Schalhautwinkel		
Galvanised		
Height: 56 cm		

Framax stripping corner l 2.70m	**171.0**	**588675000**
Framax stripping corner l 1.35m	**90.0**	**588614000**
Framax stripping corner l 3.30m	**209.9**	**588676000**
Framax-Ausschalecke l		
Galvanised, powder-coated		

	[kg]	Article N°
Framax stripping spindle I Framax-Ausschalspindel I Galvanised Height: 25 cm 	**3.2**	**588618000**
Framax stripping spindle I with ratchet Framax-Ausschalspindel I mit Ratsche Galvanised Height: 24.8 cm 	**5.5**	**588653000**
Frami tie-adapter for stripping corner I Frami-Ankeradapter für Ausschalecke I Galvanised Height: 11 cm 	**0.47**	**588492000**
Frami profile adapter for stripping corner I Frami-Profiladapter für Ausschalecke I Galvanised Height: 8 cm 	**0.60**	**588491000**
Framax quick acting clamp RU Framax-Schnellspanner RU Galvanised Length: 20 cm 	**3.3**	**588153400**
Frami panel shoe Frami-Elementschuh Galvanised Length: 16 cm 	**1.3**	**588490000**
Frami clamp Frami-Spanner Galvanised Length: 11 cm 	**1.2**	**588433000**
Frami aligning clamp Frami-Richtspanner Galvanised Length: 62 cm 	**3.2**	**588435000**
Frami adjustable clamp Frami-Ausgleichsspanner Galvanised Length: 40 cm 	**3.6**	**588436000**
Frami universal waling 0.70m **Frami universal waling 1.25m** Frami-Klemmschiene Painted blue 	**3.7** **6.4**	**588439000** **588440000**

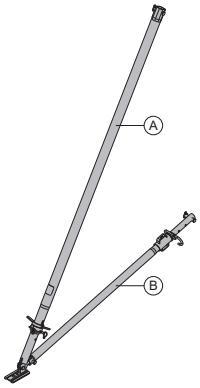
	[kg]	Article N°
Frami wedge clamp Frami-Klemme Galvanised Length: 16 cm 	**1.1**	**588441000**
Frami universal fixing bolt 5-12cm Frami-Universalverbinder 5-12cm Galvanised Length: 23 cm 	**0.43**	**588479000**
Frami profile connector 5-18cm Frami-Profilverbinder 5-18cm Galvanised Length: 33 cm 	**0.80**	**588493000**
Frami corner connector Frami-Eckverbinder Galvanised Length: 19 cm 	**0.40**	**588446000**
Frami stop-end waler tie 15-45cm Frami-Stirnabschalzwinge 15-45cm Galvanised Length: 85 cm 	**8.8**	**588498000**
Frami lifting hook Frami-Umsetzbügel Galvanised Width: 15 cm Height: 21 cm Follow the directions in the "Operating Instructions"! 	**7.5**	**588438000** CE
Plumbing strut 260 IB Justierstütze 260 IB Galvanised Length: 146.8 - 256.7 cm 	**12.8**	**588437500**

	[kg]	Article N°
Panel strut 340 IB Elementstütze 340 IB consisting of:	**24.3**	**580365000**
(A) **Plumbing strut 340 IB** Galvanised Length: 190.8 - 341.8 cm	**16.7**	**588696000**
(B) **Adjusting strut 120 IB** Galvanised Length: 81.5 - 130.6 cm	**7.6**	**588248500**



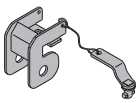
Galvanised
Delivery condition: folded closed

Panel strut 540 IB Elementstütze 540 IB consisting of:	**41.4**	**580366000**
(A) **Plumbing strut 540 IB** Galvanised Length: 310.5 - 549.2 cm	**30.7**	**588697000**
(B) **Adjusting strut 220 IB** Galvanised Length: 172.5 - 221.1 cm	**10.9**	**588251500**



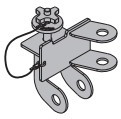
Galvanised
Delivery condition: folded closed

Strut head EB Strebenkopf EB	**1.4**	**588945000**



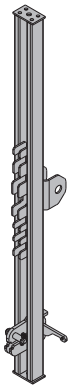
Galvanised
Width: 9 cm
Height: 14 cm

Frami prop head EB Frami-Stützenkopf EB	**2.6**	**589443000**



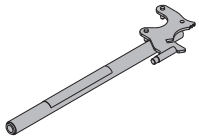
Galvanised
Width: 17 cm
Height: 22 cm

	[kg]	Article N°
Frami connection profile EB Frami-Anschlussprofil EB	**10.1**	**588462000**



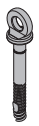
Painted blue
Height: 125 cm

Universal dismantling tool Universal-Lösewerkzeug	**3.7**	**582768000**



Galvanised
Length: 75.5 cm

Doka express anchor 16x125mm Doka-Expressanker 16x125mm	**0.31**	**588631000**

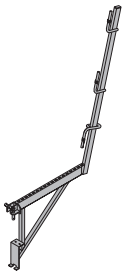


Galvanised
Length: 18 cm
Follow the directions in the "Fitting instructions"!

Doka coil 16mm Doka-Coil 16mm	**0.009**	**588633000**

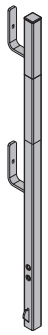
Galvanised
Diameter: 1.6 cm

Frami bracket 60 Frami-Konsole 60	**7.7**	**588442000**



Galvanised
Length: 98 cm
Height: 157 cm

Handrail post XP 1.20m Geländersteher XP 1,20m	**4.1**	**586460000**



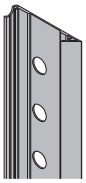
Galvanised
Height: 118 cm

	[kg]	Article N°
Toeboard holder XP 1.20m Fußwehrhalter XP 1,20m Galvanised Height: 21 cm	**0.64**	**586461000**
Handrail post XP 0.60m Geländersteher XP 0,60m Galvanised Height: 68 cm	**5.0**	**586462000**
Toeboard holder XP 0.60m Fußwehrhalter XP 0,60m Galvanised Height: 21 cm	**0.77**	**586463000**
Protective grating XP 2.70x1.20m **Protective grating XP 2.50x1.20m** **Protective grating XP 2.00x1.20m** **Protective grating XP 1.20x1.20m** Schutzgitter XP Galvanised	**22.2** **20.5** **17.4** **12.0**	**586450000** **586451000** **586452000** **586453000**
Protective grating XP 2.70x0.60m **Protective grating XP 2.50x0.60m** **Protective grating XP 2.00x0.60m** **Protective grating XP 1.20x0.60m** Schutzgitter XP Galvanised	**10.1** **9.5** **8.0** **5.0**	**586466000** **586472000** **586473000** **586491000**
Velcro fastener 30x380mm Klettverschluss 30x380mm Yellow	**0.02**	**586470000**
Railing clamp XP 40cm Geländerzwinge XP 40cm Galvanised Height: 73 cm	**7.7**	**586456000**

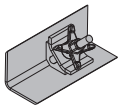
	[kg]	Article N°
Frami adapter XP Frami-Adapter XP Galvanised Height: 91.5 cm	**10.0**	**586477000**
Handrail clamp S Schutzgeländerzwinge S Galvanised Height: 123 - 171 cm	**11.5**	**580470000**
Bracket adapter XP FRR 50/30 Konsolenadapter XP FRR 50/30 Galvanised Height: 32 cm	**2.4**	**586486000**
Scaffold tube 48.3mm 0.50m	**1.7**	**682026000**
Scaffold tube 48.3mm 1.00m	**3.6**	**682014000**
Scaffold tube 48.3mm 1.50m	**5.4**	**682015000**
Scaffold tube 48.3mm 2.00m	**7.2**	**682016000**
Scaffold tube 48.3mm 2.50m	**9.0**	**682017000**
Scaffold tube 48.3mm 3.00m	**10.8**	**682018000**
Scaffold tube 48.3mm 3.50m	**12.6**	**682019000**
Scaffold tube 48.3mm 4.00m	**14.4**	**682021000**
Scaffold tube 48.3mm 4.50m	**16.2**	**682022000**
Scaffold tube 48.3mm 5.00m	**18.0**	**682023000**
Scaffold tube 48.3mm 5.50m	**19.8**	**682024000**
Scaffold tube 48.3mm 6.00m	**21.6**	**682025000**
Scaffold tube 48.3mm .....m Gerüstrohr 48,3mm Galvanised	**3.6**	**682001000**
Scaffold tube connection Gerüstrohranschluss Galvanised Height: 7 cm	**0.27**	**584375000**
Screw-on coupler 48mm 50 Anschraubkupplung 48mm 50 Galvanised Width-across: 22 mm Follow the directions in the "Fitting instructions"!	**0.84**	**682002000**
Frami frame hole plug Frami-Ankerstopfen Blue Diameter: 2.5 cm	**0.002**	**588444000**

	[kg]	Article N°
Framax triangular ledge 2.70m Framax-Dreikantleiste 2,70m	**0.38**	**588170000**

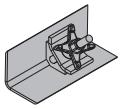
Frami frontal triangular ledge 2.70m **Frami frontal triangular ledge 3.00m** Frami-Stirndreikantleiste Grey	**1.5** **1.7**	**588496000** **588497000**



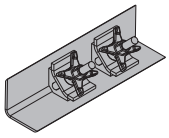
Box-out clamp 24cm **Box-out clamp 25cm** **Box-out clamp 30cm** Aussparungsklemme Galvanised Leg length: 10 cm	**3.4** **3.4** **3.9**	**580063000** **580064000** **580065000**



Box-out clamp type 1 .....cm Aussparungsklemme Typ 1 .....cm Painted blue Leg length: 10 cm	**17.4**	**580066000**



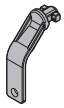
Box-out clamp type 2 .....cm Aussparungsklemme Typ 2 .....cm Painted blue Leg length: 10 cm	**17.4**	**580067000**



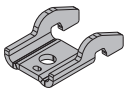
Frami plug Frami-Abdeckstopfen Yellow Diameter: 2 cm	**0.003**	**588445000**

Frami tie-holder bracket Frami-Ankerhaltewinkel Galvanised	**0.58**	**588453000**

Frami clip Frami-Stecker Galvanised Width: 3 cm Height: 12 cm	**0.26**	**588434000**



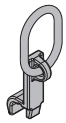
Frami floor fixing plate Frami-Bodenhalter Galvanised Length: 12.7 cm Width: 6.7 cm	**0.53**	**588495000**



Frami stacking cone Frami-Stapelkonus Blue Diameter: 2.6 cm	**0.01**	**589444000**

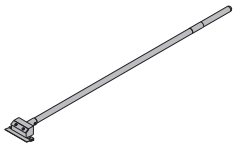
	[kg]	Article N°
Doka 4-part chain 3.20m Doka-Vierstrangkette 3,20m Follow the directions in the "Operating Instructions"!	**15.0**	**588620000**

Frami transport hook Frami-Transporthaken Galvanised Length: 17.5 cm Follow the directions in the "Operating Instructions"!	**0.56**	**588494000**

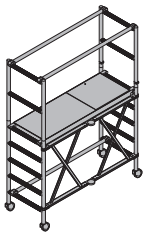


Dokamatic lifting strap 13.00m Dokamatic-Umsetzgurt 13,00m Green Follow the directions in the "Operating Instructions"!	**10.5**	**586231000**

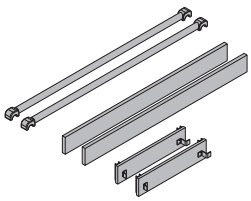
Double scraper Xlife 100/150mm 1.40m Doppelschaber Xlife 100/150mm 1,40m	**2.8**	**588674000**



Wheel-around scaffold DF Mobilgerüst DF Aluminium Length: 185 cm Width: 80 cm Height: 255 cm Delivery condition: separate parts	**44.0**	**586157000**

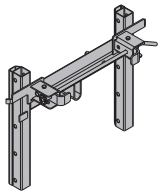


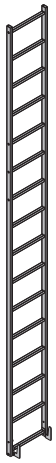
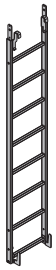
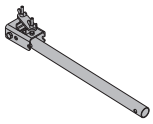
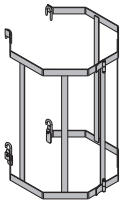
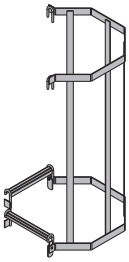
Wheel-around scaffold DF accessory set Zubehörset Mobilgerüst DF Aluminium Timber parts varnished yellow Length: 189 cm	**13.3**	**586164000**



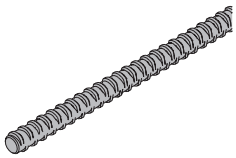
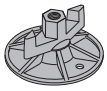
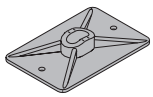
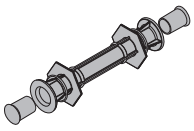
Ladder system XS

Connector XS Wall formwork Anschluss XS Wandschalung Galvanised Width: 89 cm Height: 63 cm	**20.8**	**588662000**



	[kg]	Article N°
System ladder XS 4.40m System-Leiter XS 4,40m Galvanised	**33.2**	**588640000**
		
Ladder extension XS 2.30m Leiternverlängerung XS 2,30m Galvanised	**19.1**	**588641000**
		
Securing barrier XS Sicherungsschranke XS Galvanised Length: 80 cm	**4.9**	**588669000**
		
Ladder cage XS 1.00m **Ladder cage XS 0.25m** Rückenschutz XS Galvanised	**16.5** **10.5**	**588643000** **588670000**
		
Ladder cage exit XS Rückenschutz-Ausstieg XS Galvanised Height: 132 cm	**17.0**	**588666000**
		

Tie rod system 15.0

	[kg]	Article N°
Tie rod 15.0mm galvanised 0.50m	**0.72**	**581821000**
Tie rod 15.0mm galvanised 0.75m	**1.1**	**581822000**
Tie rod 15.0mm galvanised 1.00m	**1.4**	**581823000**
Tie rod 15.0mm galvanised 1.25m	**1.8**	**581826000**
Tie rod 15.0mm galvanised 1.50m	**2.2**	**581827000**
Tie rod 15.0mm galvanised 1.75m	**2.5**	**581828000**
Tie rod 15.0mm galvanised 2.00m	**2.9**	**581829000**
Tie rod 15.0mm galvanised 2.50m	**3.6**	**581852000**
Tie rod 15.0mm galvanised .....m	**1.4**	**581824000**
Tie rod 15.0mm non-treated 0.50m	**0.73**	**581870000**
Tie rod 15.0mm non-treated 0.75m	**1.1**	**581871000**
Tie rod 15.0mm non-treated 1.00m	**1.4**	**581874000**
Tie rod 15.0mm non-treated 1.25m	**1.8**	**581886000**
Tie rod 15.0mm non-treated 1.50m	**2.1**	**581876000**
Tie rod 15.0mm non-treated 1.75m	**2.5**	**581887000**
Tie rod 15.0mm non-treated 2.00m	**2.9**	**581875000**
Tie rod 15.0mm non-treated 2.50m	**3.6**	**581877000**
Tie rod 15.0mm non-treated 3.00m	**4.3**	**581878000**
Tie rod 15.0mm non-treated 3.50m	**5.0**	**581888000**
Tie rod 15.0mm non-treated 4.00m	**5.7**	**581879000**
Tie rod 15.0mm non-treated 5.00m	**7.2**	**581880000**
Tie rod 15.0mm non-treated 6.00m	**8.6**	**581881000**
Tie rod 15.0mm non-treated 7.50m	**10.7**	**581882000**
Tie rod 15.0mm non-treated .....m Ankerstab 15,0mm	**1.4**	**581873000**
		DIN 18216
Super plate 15.0 Superplatte 15,0 Galvanised Height: 6 cm Diameter: 12 cm Width-across: 27 mm	**1.1**	**581966000**
		DIN 18216
Wing nut 15.0 Flügelmutter 15,0 Galvanised Length: 10 cm Height: 5 cm Width-across: 27 mm	**0.31**	**581961000**
		DIN 18216
Angle anchor plate 12/18 Winkelplatte 12/18 Galvanised	**1.5**	**581934000**
		DIN 18216
Hexagon nut 15.0 Sechskantmutter 15,0 Galvanised Length: 5 cm Width-across: 30 mm	**0.23**	**581964000**
		DIN 18216
Frami pressure plate 8/9 Frami-Druckplatte 8/9 Galvanised	**0.55**	**588466000**
		
Distance piece 20cm	**0.04**	**581907000**
Distance piece 25cm	**0.05**	**581908000**
Distance piece 30cm Distanzhalter PE Grey Blue	**0.06**	**581909000**
		

	[kg]	Article N°
Plastic tube 22mm 2.50m Kunststoffrohr 22mm 2,50m PVC Grey Diameter: 2.6 cm	**0.45**	**581951000**
Universal cone 22mm Universal-Konus 22mm Grey Diameter: 4 cm	**0.005**	**581995000**
Plug 22mm Verschlussstopfen 22mm PE Grey	**0.003**	**581953000**
Protective cap 15.0/20.0 Schutzkappe 15,0/20,0 Yellow Length: 6 cm Diameter: 6.7 cm	**0.03**	**581858000**
Tie-rod wrench 15.0/20.0 Ankerstabschlüssel 15,0/20,0 Galvanised Length: 37 cm Diameter: 8 cm	**1.9**	**580594000**
Friction type ratchet SW27 Freilaufknarre SW27 Manganese-phosphated Length: 30 cm	**0.49**	**581855000**
Box spanner 27 0.65m Steckschlüssel 27 0,65m Galvanised	**1.9**	**581854000**

Multi-trip packaging

Frami pallet 1.20m Frami-Palette 1,20m Galvanised Length: 138 cm Width: 100 cm Height: 114 cm	**66.0**	**588478000**
Frami pallet 1.50m Frami-Palette 1,50m Galvanised Length: 168 cm Width: 100 cm Height: 114 cm	**69.0**	**588476000**
Alu-Framax pallet Alu-Framax-Palette Galvanised Length: 280 cm Width: 110 cm Height: 107 cm Delivery condition: folded closed	**126.7**	**588396000**
Doka multi-trip transport box 1.20x0.80m Doka-Mehrwegcontainer 1,20x0,80m Galvanised Height: 78 cm	**70.0**	**583011000**
Multi-trip transport box partition 0.80m **Multi-trip transport box partition 1.20m** Mehrwegcontainer Unterteilung Steel parts galvanised Timber parts varnished yellow	**3.7** **5.5**	**583018000** **583017000**
Doka multi-trip transport box 1.20x0.80x0.41m Doka-Mehrwegcontainer 1,20x0,80x0,41m Galvanised	**42.5**	**583009000**
Doka accessory box Doka-Kleinteilebox Timber parts varnished yellow Steel parts galvanised Length: 154 cm Width: 83 cm Height: 77 cm	**106.4**	**583010000**

	[kg]	Article N°
Bolt-on castor set B Anklemm-Radsatz B Painted blue	**33.6**	**586168000**
Doka skeleton transport box 1.70x0.80m Doka-Gitterbox 1,70x0,80m Galvanised Height: 113 cm	**87.0**	**583012000**
Doka stacking pallet 1.55x0.85m Doka-Stapelpalette 1,55x0,85m Galvanised Height: 77 cm	**41.0**	**586151000**
Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m Galvanised Height: 77 cm	**38.0**	**583016000**

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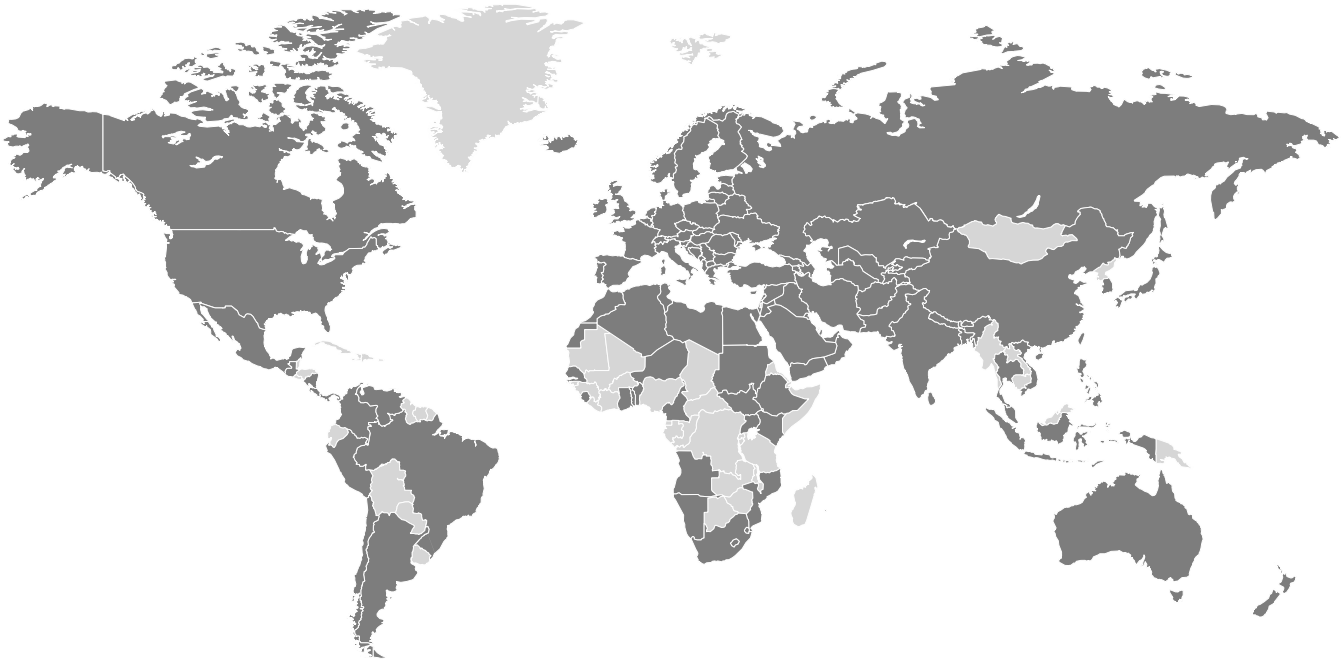

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