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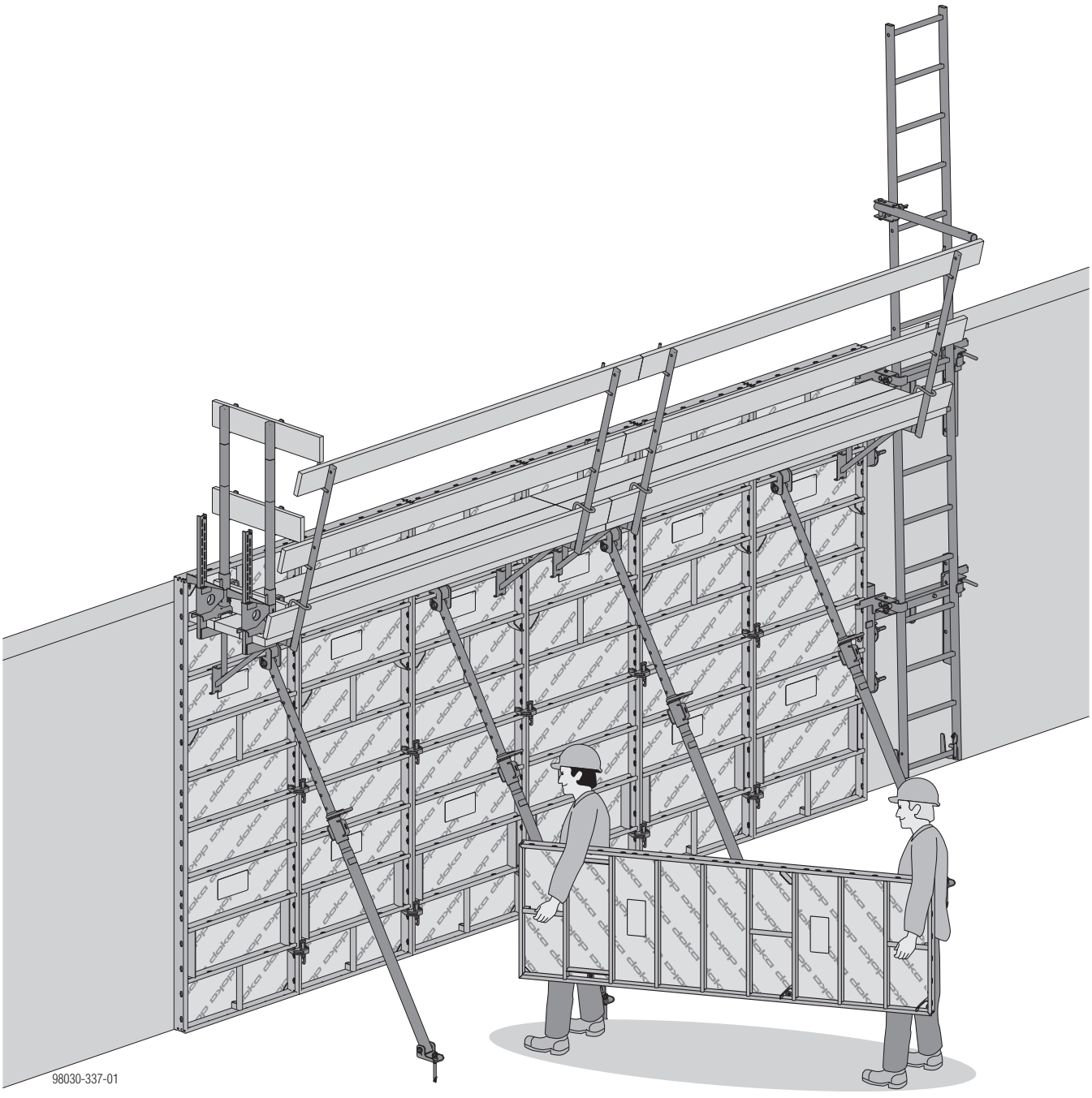
The Formwork Experts.

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 booklet can also be used as a generic method statement or incorporated with a site-specific method statement.
- **Many of the illustrations in this booklet show the situation during formwork assembly and are therefore not always complete from the safety point of view.**
  Any safety accessories not shown in these illustrations must still be used by the customer, in accordance with the applicable rules and regulations.
- **Further safety instructions, especially warnings, will be found in the individual sections of this booklet!**

Planning

- Provide safe workplaces for those using the formwork (e.g. for when it is being erected/dismantled, modified or repositioned etc). It must be possible to get to and from these workplaces via safe access routes!
- **If you are considering any deviation from the details and instructions given in this booklet, or any application which goes beyond those described in the booklet, then revised static calculations must be produced for checking, as well as supplementary assembly instructions.**

Regulations; industrial safety

- All laws, Standards, industrial safety regulations and other safety rules applying to the utilisation of our products in the country and/or region in which you are operating must be observed at all times.
- If a person or object falls against, or into, the side-guard component and/or any of its accessories, the component affected may only continue in use after it has been inspected and passed by an expert.

Rules applying during all phases of the assignment

- The customer must ensure that this product is erected and dismantled, reset and generally used for its intended purpose in accordance with the applicable laws, standards and rules, under the direction and supervision of suitably skilled persons.
  These persons' mental and physical capacity must not in any way be impaired by alcohol, medicines or drugs.
- Doka products are technical working appliances which are intended for industrial / commercial use only, always in accordance with the respective Doka User Information booklets or other technical documentation authored by Doka.
- The stability and load-bearing capacity of all components and units must be ensured during all phases of the construction work!
- Do not step on or apply strain to cantilevers, closures, etc. until suitable measures to ensure their stability have been correctly implemented (e.g. by tie-backs).
- Strict attention to and compliance with the functional instructions, safety instructions and load specifications are required. Non-compliance can cause accidents and severe injury (risk of fatality) and considerable damage to property.
- Sources of fire in the vicinity of the formwork are prohibited. Heating appliances are only allowed if properly and expertly used, and set up a safe distance away from the formwork.
- The customer must consider all types of weather conditions on equipment and in connection with the use or storage of the equipment (e.g. slippery surfaces, risk of slippage, effects of wind, etc.) and must take steps in good time to safeguard the equipment and the surrounding areas and to protect the 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 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 suitable condition. Steps must be taken to rule out the use of any components that are damaged, deformed, or weakened due to wear, corrosion or rot.
- Combining our formwork systems with those of other manufacturers could be dangerous, risking damage to both health and property. If you intend to combine different systems, please contact Doka for advice first.
- The equipment/system must be assembled and erected in accordance with the applicable laws, Standards and rules by suitably skilled personnel of the customer's, having regard to any and all required safety inspections.
- It is not permitted to modify Doka products; any such modifications constitute a safety risk.

Closing the formwork

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

Pouring

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

Stripping out the formwork

- Do not strip out the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be stripped out!
- When stripping out the formwork, never use the crane to break concrete cohesion. Use suitable tools such as timber wedges, special pry-bars or system features such as Framax stripping corners.
- When stripping out the formwork, do not endanger the stability of any part of the structure, or of any scaffolding, platforms or formwork that is still in place!

Transporting, stacking and storing

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

Maintenance

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

Miscellaneous

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

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

Symbols used

The following symbols are used in this booklet:

DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE
Is used to address practices not related to physical injury.

Instruction
Indicates that actions need to be taken by the user.

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

Tip
Points out useful practical tips.

Reference
Refers to other documents and materials.

Eurocodes at Doka

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

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

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

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

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

$$E_d \leq R_d$$

E_d **Design value of effect of actions**
(E ... effect; d ... design)
Internal forces from action F_d
(V_{Ed}, N_{Ed}, M_{Ed})

F_d **Design value of an action**
$F_d = \gamma_F \cdot F_k$
(F ... force)

F_k **Characteristic value of an action**
"actual load", service load
(k ... characteristic)
e.g. dead weight, live load, concrete pressure, wind

γ_F **Partial factor for actions**
(in terms of load; F ... force)
e.g. for dead weight, live load, concrete pressure, wind
Values from EN 12812

R_d **Design value of the resistance**
(R ... resistance; d ... design)
Design capacity of cross-section
(V_{Rd}, N_{Rd}, M_{Rd})

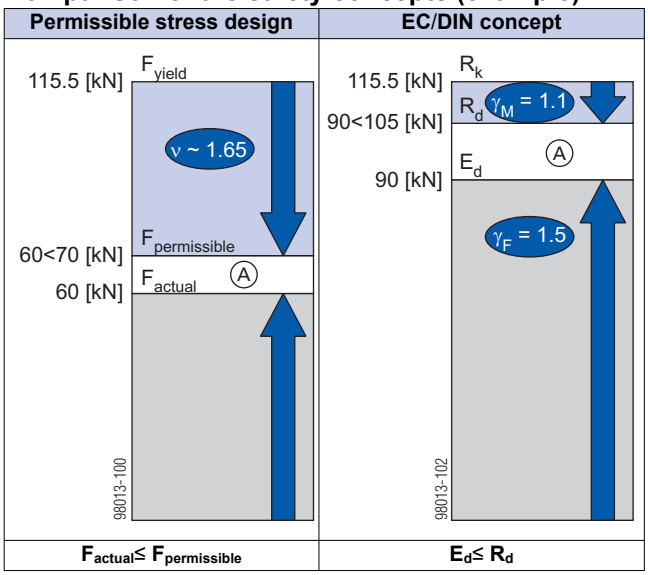
Steel: $R_d = \frac{R_k}{\gamma_M}$ Timber: $R_d = k_{mod} \cdot \frac{R_k}{\gamma_M}$

R_k **Characteristic value of the resistance**
e.g. moment resistance to yield stress

γ_M **Partial factor for a material property**
(in terms of material; M...material)
e.g. for steel or timber
Values from EN 12812

k_{mod} **Modification factor** (only for timber – to take account of the moisture and the duration of load action)
e.g. for Doka beam H20
Values as given in EN 1995-1-1 and EN 13377

Comparison of the safety concepts (example)



A Utilisation factor

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

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

Allowance has been made for the following partial factors:
γ_F = 1.5
$\gamma_{M,\ timber}$ = 1.3
$\gamma_{M,\ steel}$ = 1.1
k_{mod} = 0.9

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

Doka services

Support in every stage of the project

Doka offers a broad spectrum of services, all with a single aim: to help you succeed on the site.

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

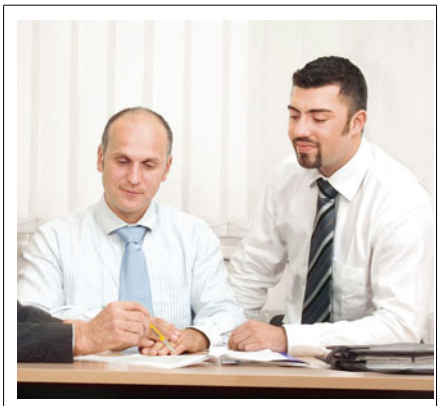
Project Development Stage

Taking well-founded decisions thanks to professional advice and consulting

Find precisely the right formwork solutions, with the aid of

- help with the bid invitation
- in-depth analysis of the initial situation
- objective evaluation of the planning, execution, and time-risks

Bidding Stage



Optimising the preliminary work with Doka as an experienced partner

Draw up potentially winning bids, by

- basing them on realistically calculated guideline prices
- making the right formwork choices
- having an optimum time-calculation basis

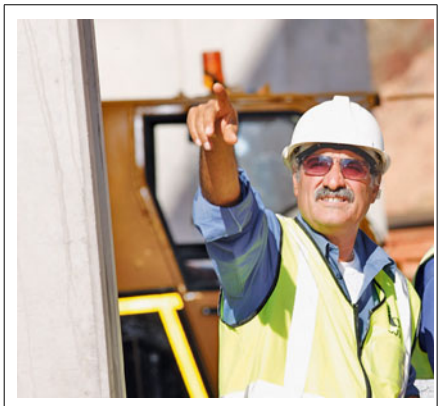
Operations Scheduling Stage

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

Plan cost-effectively right from the outset, thanks to

- detailed offers
- determination of the commissioning quantities
- co-ordination of lead-times and handover deadlines

Concrete Construction Stage



Optimum resource utilisation
with assistance from the Doka Formwork Experts

Workflow optimisation, thanks to

- thorough utilisation planning
- internationally experienced project technicians
- appropriate transport logistics
- on-site support

Project Close-out Stage

Seeing things through to a positive conclusion
with professional support

Doka Services are a byword for transparency and efficiency here, offering

- jointly handled return of rented formwork
- professional dismantling
- efficient cleaning and reconditioning using special equipment

The advantages for you
thanks to professional advice and consulting

- **Cost savings and time gains**
  When we advise and support you right from the word 'go', we can make sure that the right formwork systems are chosen and then used as planned. This lets you achieve optimum utilisation of the formwork equipment, and effective forming operations because your workflows will be correct.
- **Maximised workplace safety**
  The advice and support we can give you in how to use the equipment correctly, and as planned, leads to greater safety on the job.
- **Transparency**
  Because our services and costs are completely transparent, there is no need for improvisation during the project – and no unpleasant surprises at the end of it.
- **Reduced close-out costs**
  Our professional advice on the selection, quality and correct use of the equipment helps you avoid damage, and minimise wear-and-tear.

Doka 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

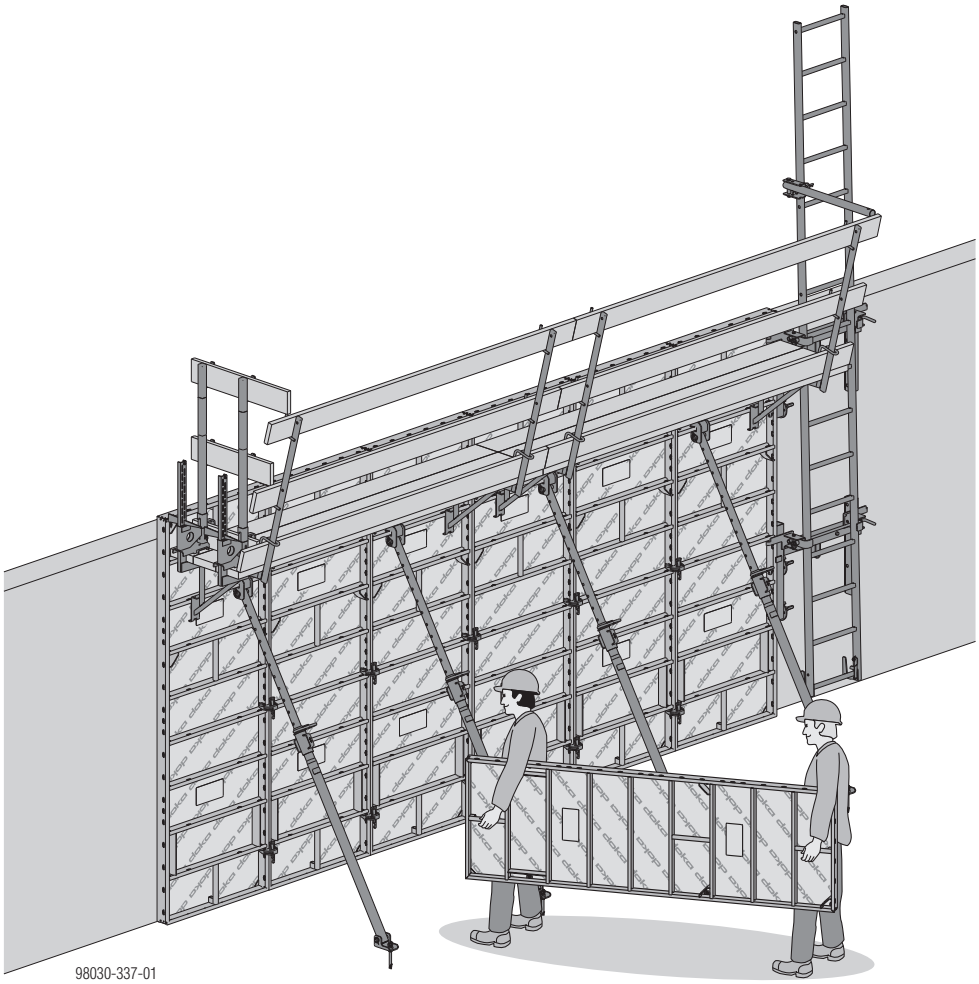
- lowers close-out and rehabilitation costs
- ensures that the formwork system will have a long service life

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

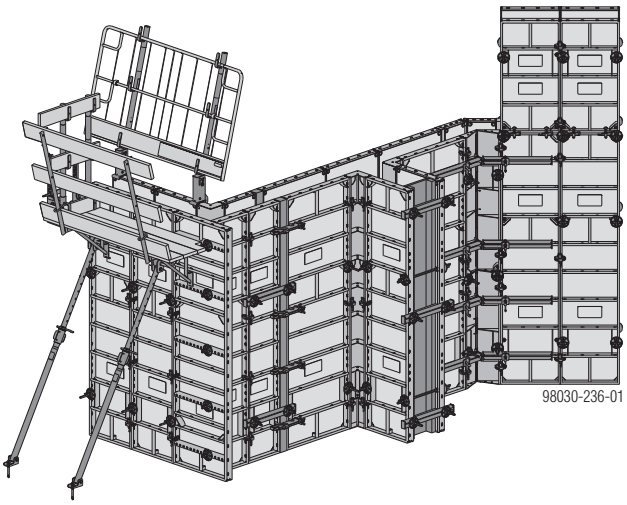


Note:

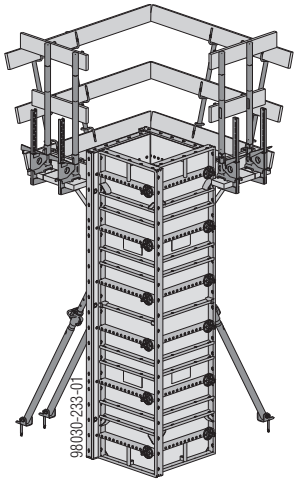
All the **technical data** given in this document apply equally to both **Frami Xlife panels** and **Frami eco panels**.

Areas of use

Wall formwork

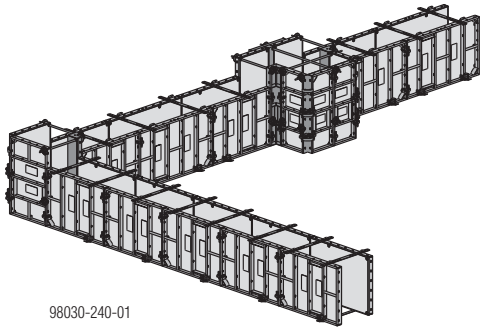


Column formwork



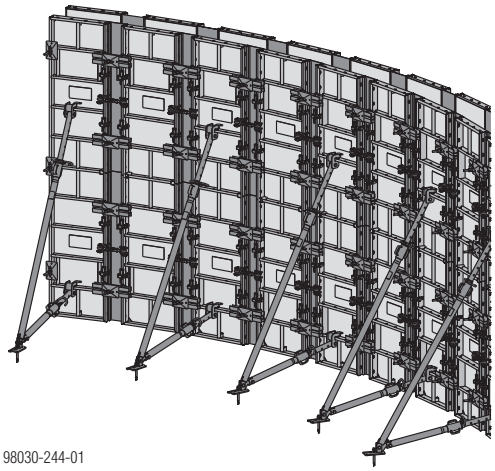
Follow the directions in the 'Column formwork Frami Xlife' User Information booklet!

Foundation formwork



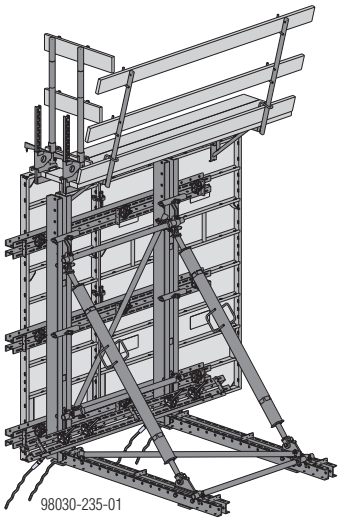
Follow the directions in the 'Foundation formwork Frami Xlife' User Information booklet!

Circular formwork



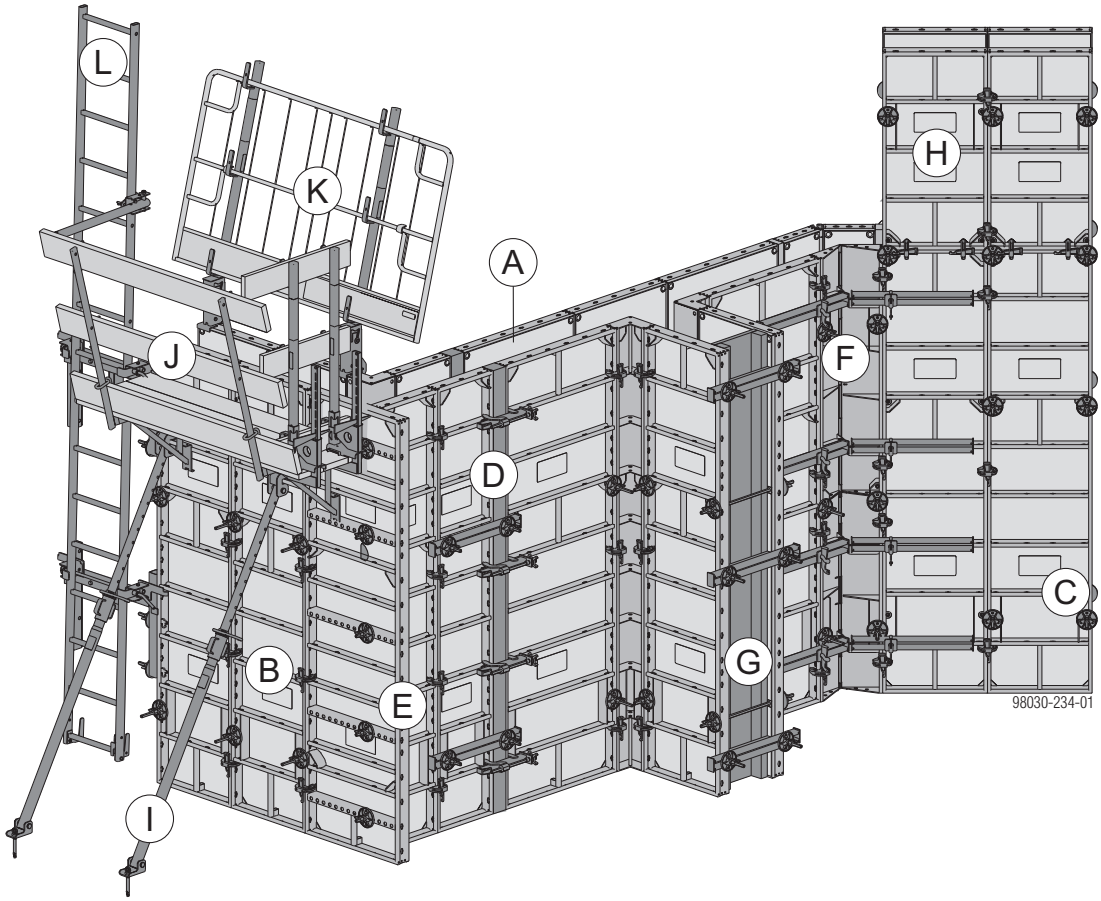
Follow the directions in the 'Circular formwork Frami Xlife' User Information booklet!

Single-sided formwork



Follow the directions in the “Doka supporting construction frames” User Information!

Wall formwork



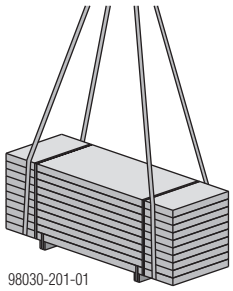
Instructions for assembly and use (Method statement)

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").

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.

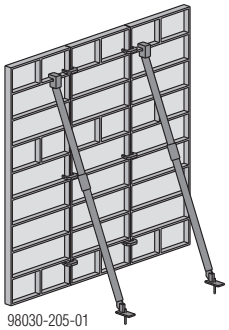
CAUTION

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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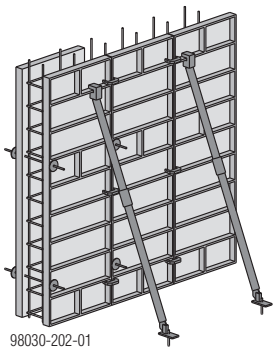
Erecting the opposing formwork:

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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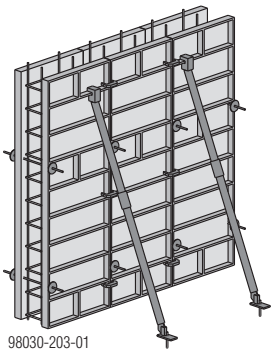
Now the opposing formwork is also secured against tipping over.

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



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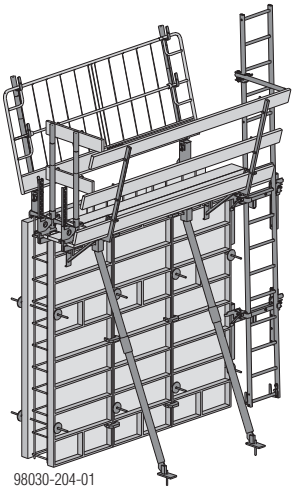
Mounting the pouring platform and ladderway

➤ 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").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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 out 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 multi-panel elements can be pre-assembled face-down on a level screed floor. See 'Vertical stacking of panels' for detailed instructions on how to attach the interpanel connectors.

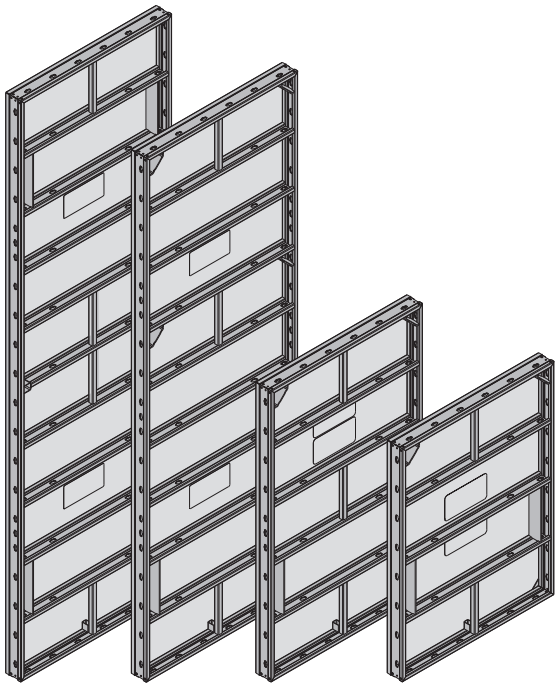
These gangs can be lifted and reset with lifting chains and Frami lifting hooks. For detailed instructions on this, see the section headed 'Resetting by crane'.

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

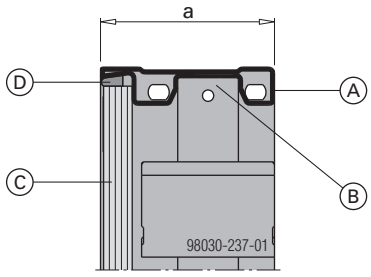
The Frami panel in detail

Frami Xlife panels

High load-bearing capacity



Dimensionally stable steel frame made of hollow profiles



a ... 92 mm

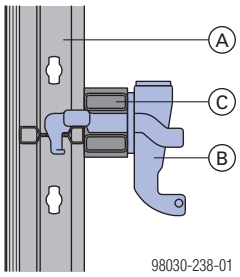
A Frame profile
B Continuous hardware slot for inter-panel connectors
C Xlife sheet
D Silicone sealing strip

- 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

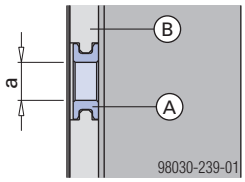
➤ It is forbidden to climb on the cross-profiles. The cross-profiles are NOT a substitute for a ladder.

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

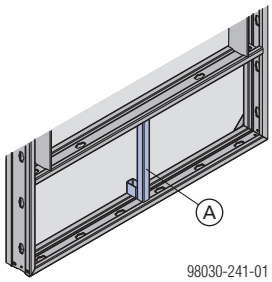
Clean concrete surfaces with the innovative Xlife sheet

The Xlife sheet consists of a **combination of a traditional plywood core and a novel and innovative 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

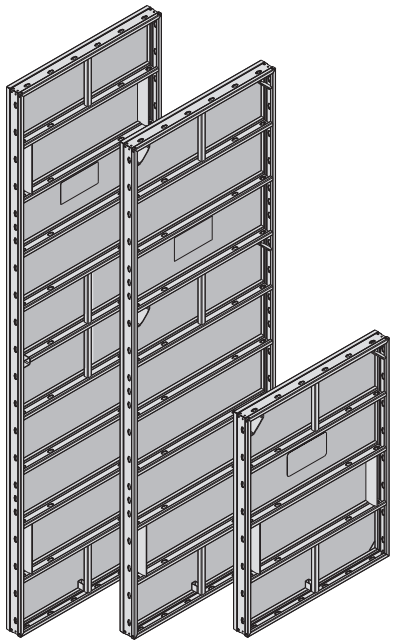
WARNING

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 "Resetting by crane" and "Transporting, stacking and storing".

Frami eco panels



Differences from Frami Xlife panels:

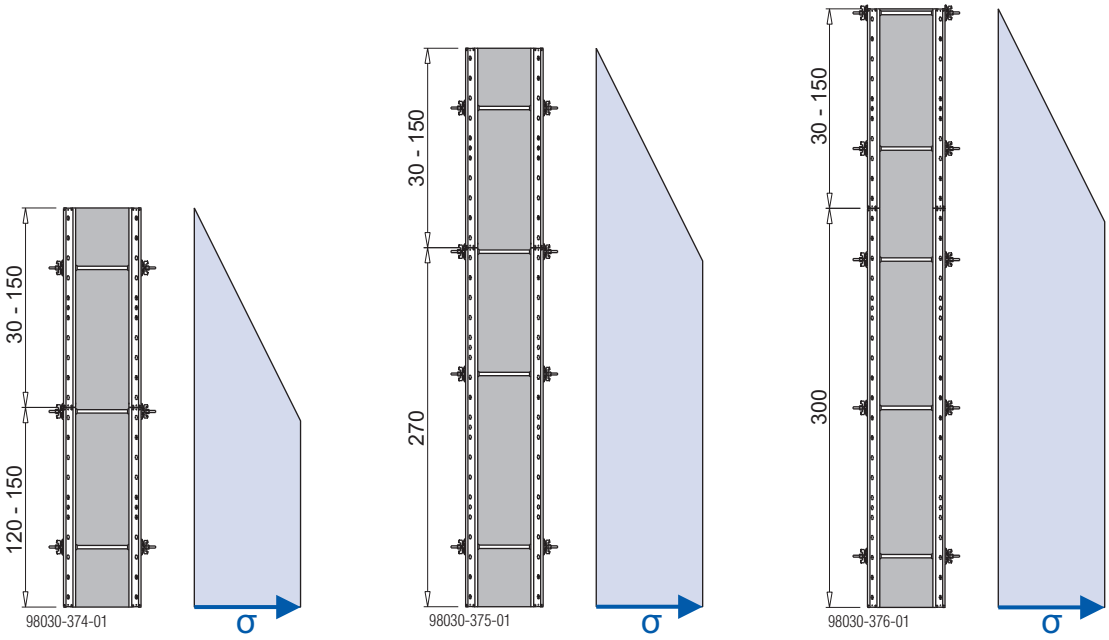
- powder-coated steel frames
- high-quality 15 mm thick film-coated formwork sheet

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:

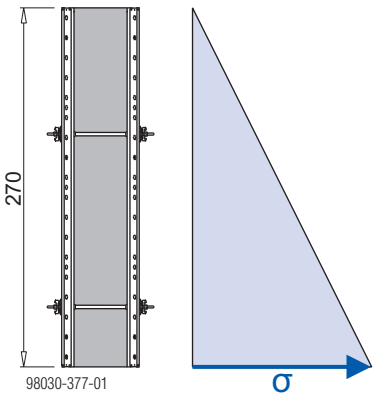
$\sigma_{hk, max}$ = 40 kN/m²

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



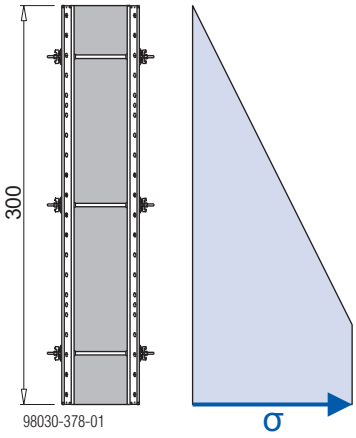
$\sigma_{hk, max, hydr}$ = 67.5 kN/m²

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.



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

	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:

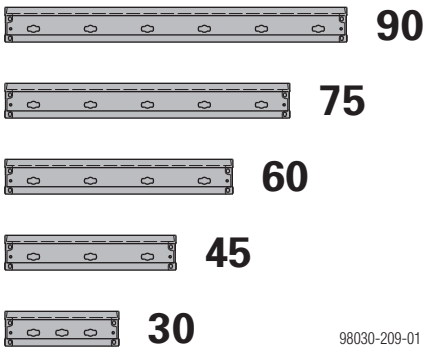
All other Frami accessories are loadable with an increased fresh-concrete pressure of up to 70 kN/m² (only applies when using the approved Frami panels as per the table).

System grid

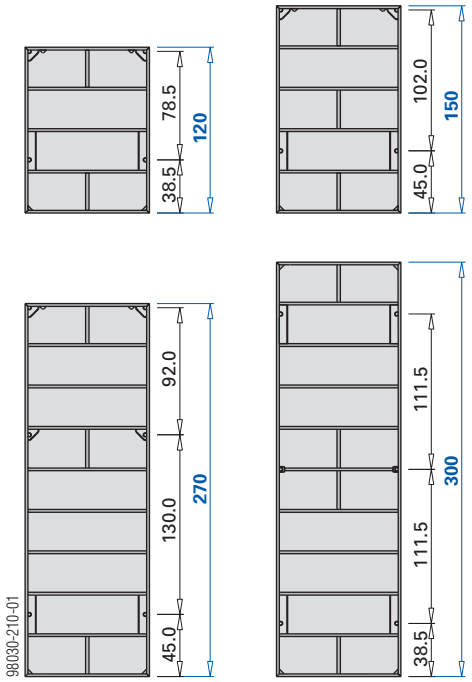
Frami Xlife panels

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

Panel widths



Panel heights



Dimensions in cm

Frami eco panels

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

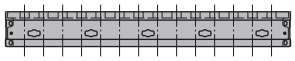
Frami Xlife universal panels

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

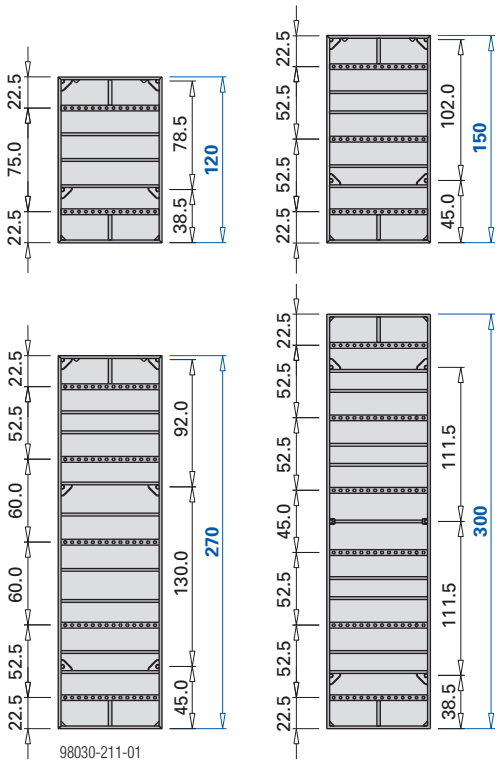
Panel width



75

98030-213-01

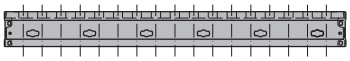
Panel heights



Dimensions in cm

Frami Xlife universal panel 0.90m

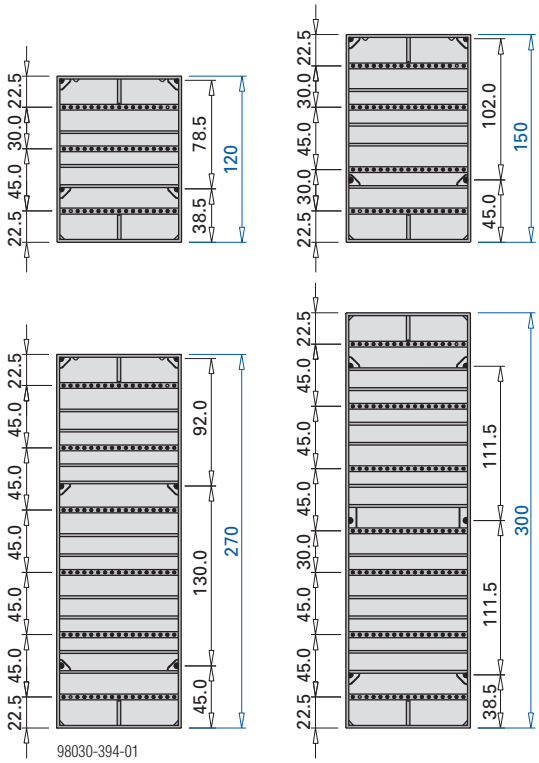
Panel width



90

98030-394-02

Panel heights

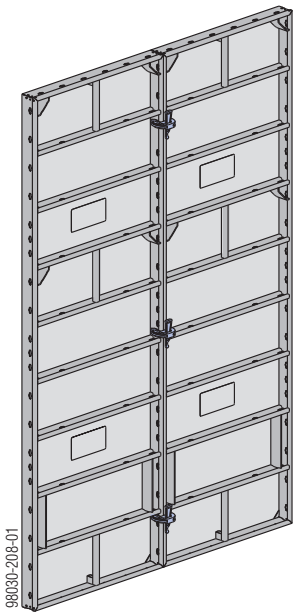


Dimensions in cm

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

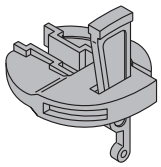
Note:

- 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".

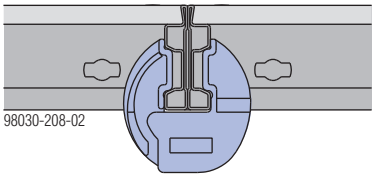
Simple inter-panel connections

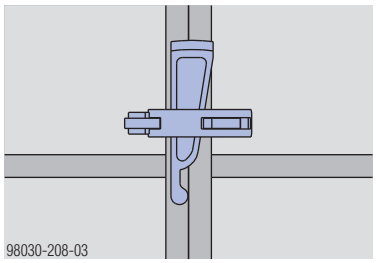
with the Frami clamp

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.



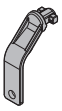
Frami clamp:
Permitted tensile force: 10.0 kN
Permitted shear force: 5.0 kN
Permitted moment: 0.2 kNm

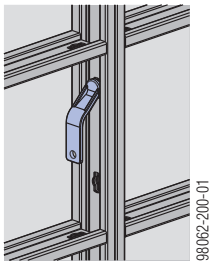




with the Frami clip

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.





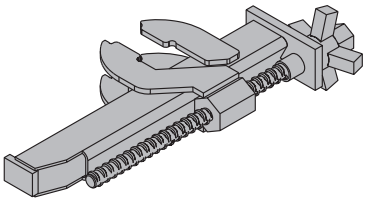
Frami clip:
Permitted tensile force: 10.0 kN
Permitted shear force: 5.0 kN
Permitted moment: 0.2 kNm

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

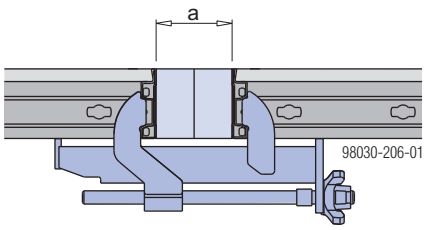
Self-aligning inter-panel connections and closures

with the Frami adjustable clamp

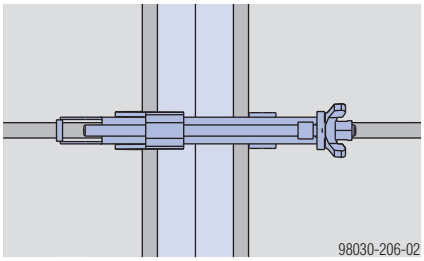
Closures can be bridged easily and economically with Frami fitting timbers. With the Frami adjustable clamp, the panels are joined so that they are resistant to tensile forces, and are aligned at the same time. The adjustable clamp is placed directly over the cross profile.



Frami adjustable clamp:
Permitted tensile force: 7.5 kN



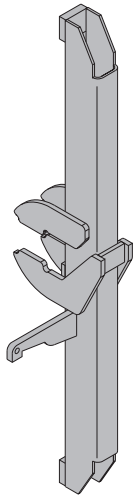
a ... max. 15 cm



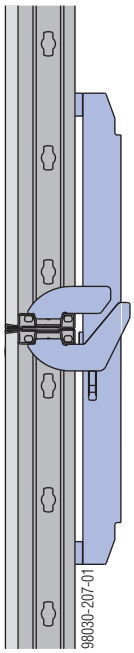
Stiffening inter-panel connections

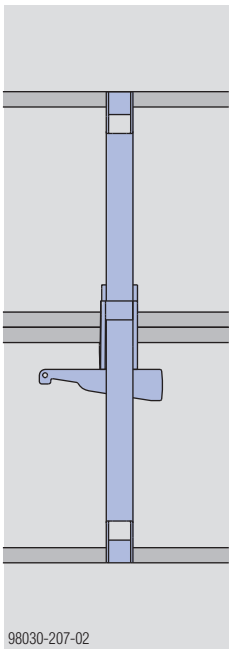
with the Frami aligning clamp

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





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".

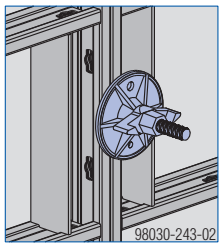
WARNING

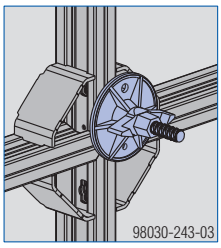
Sensitive rod steel!

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

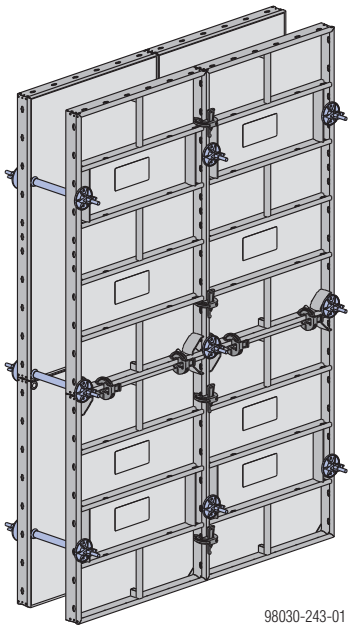
Note:

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



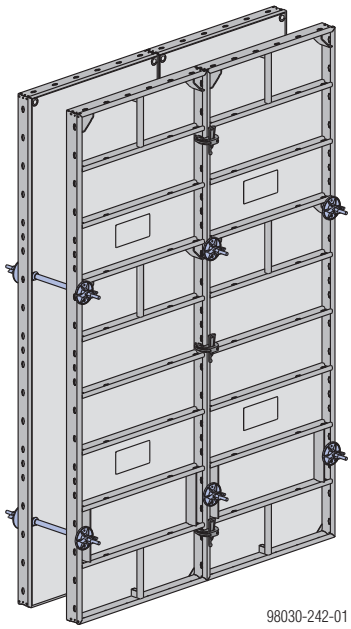


Frami Xlife panel 1.20 + 1.50m

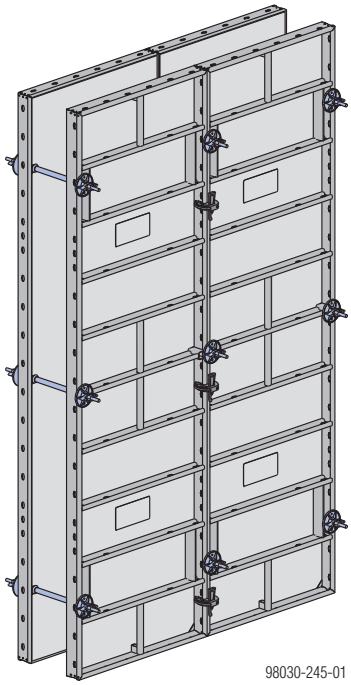


Frami Xlife panel 2.70m

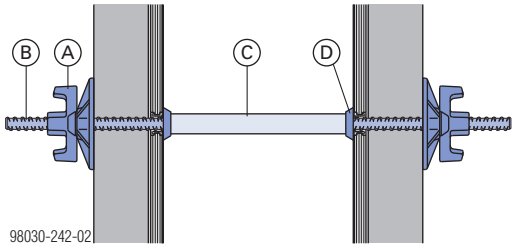
Up to a **pour-height** of **2.70 m** (on unstacked panels) **only 2 form-ties** are needed in the vertical in the Frami Xlife panel 2.70m.



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**.

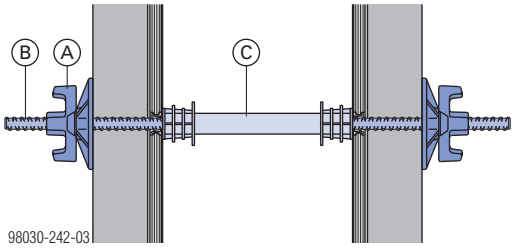
Note:
Doka also offer economical solutions for making watertight form-tie points.

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.

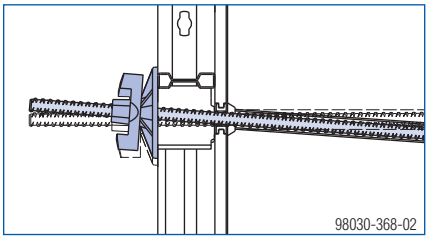


A Super-plate 15.0
B Tie-rod 15.0mm
C Distance piece (ready for use for certain wall thicknesses)

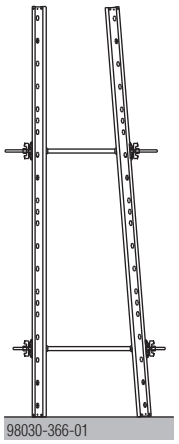
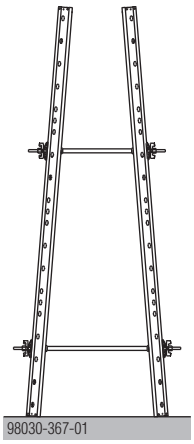
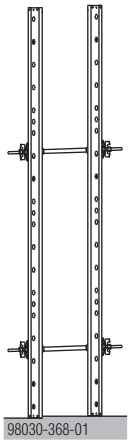
The stoppers for plugging the distance pieces are also included.

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).

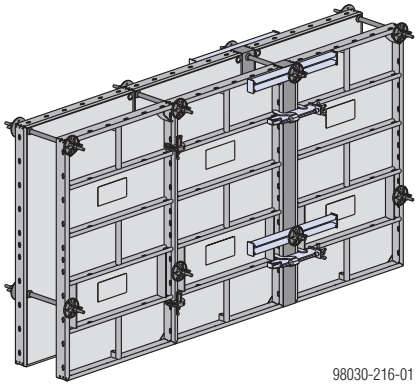
Length adjustment using closures

Closures: 0 - 15 cm

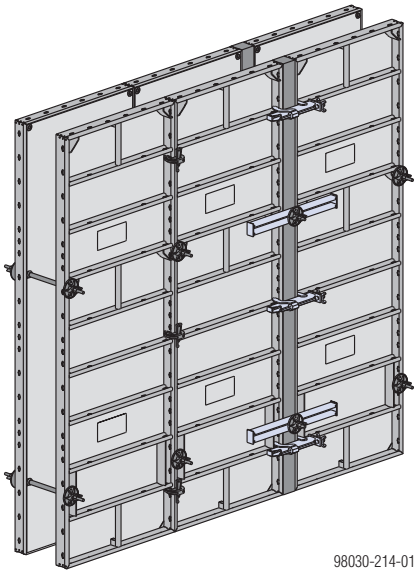
with fitting timber and adjustable clamp

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.

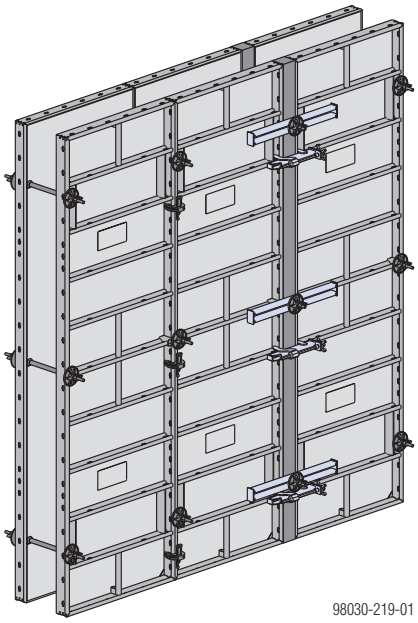
Frami universal waling:
Permitted moment: 1.3 kNm



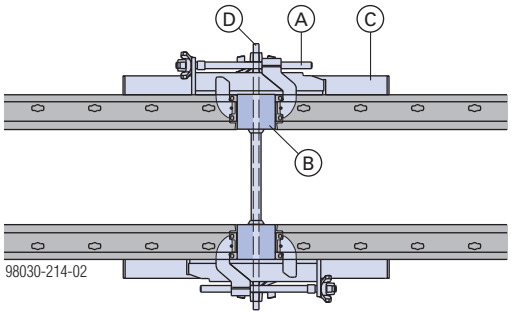
Shown here on Frami Xlife panels 1.50m.



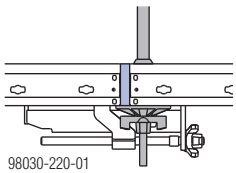
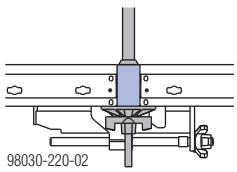
Shown here on Frami Xlife panels 2.70m.

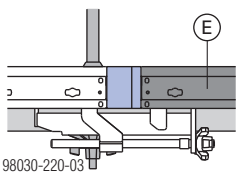
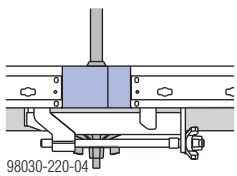


Shown here on Frami Xlife panels 3.00m.



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

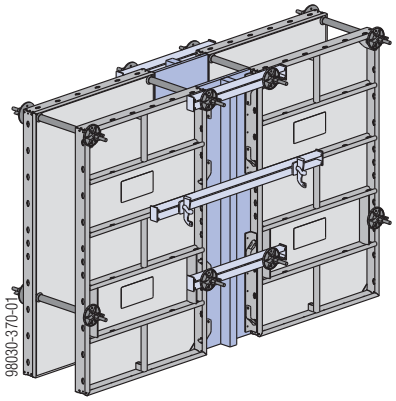
Closures up to **2 cm**	Closures up to **5 cm**
Ties through panel, without Universal waling	Ties through fitting timber, without Universal waling
	

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

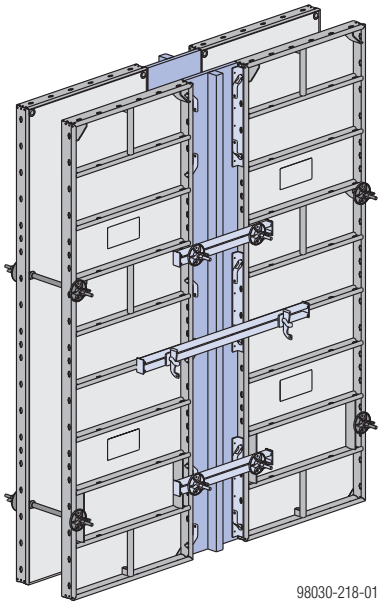
E Frami Xlife panel (max. 0.75m)

Closures: 10 - 50 cm

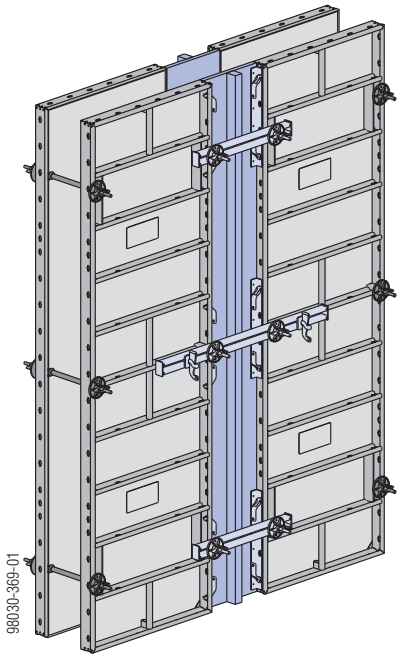
with plywood support and formwork sheet



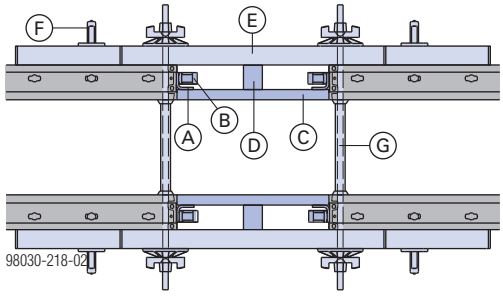
Shown here on Frami Xlife panels 1.50m.



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.

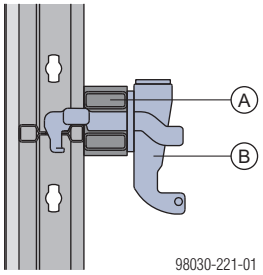
Possible ways of attaching Universal walings:

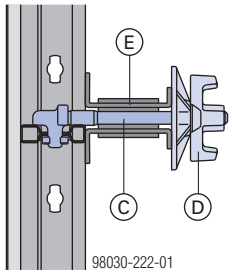
For clamp-on parts with an **overall height of 5 cm** (Frami universal waling **(A)**):

- Frami wedge clamp **(B)**

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

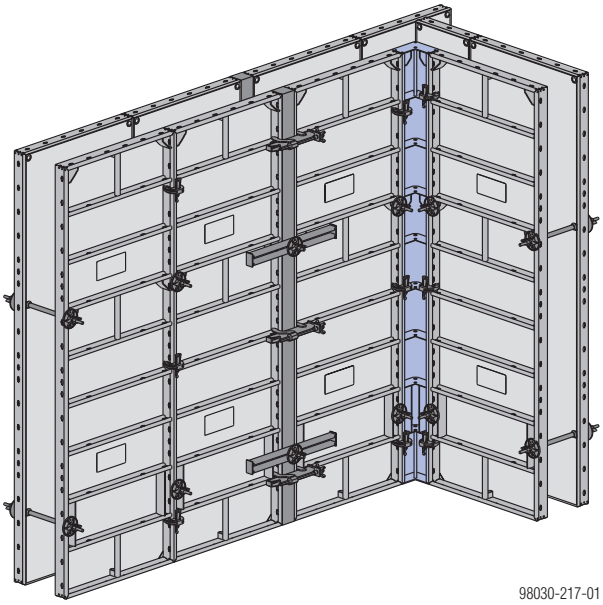
- Frami universal fixing bolt **(C)** + Super-plate **(D)**



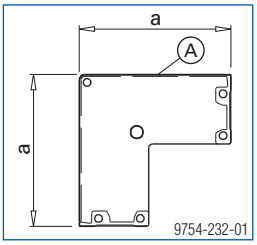


90 degree corners

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

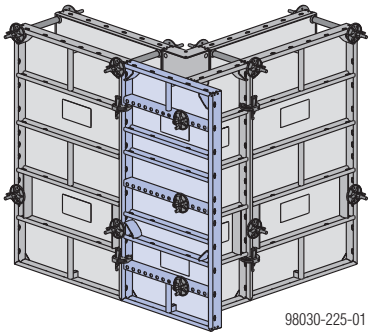
There are **2 ways** of forming right-angled **outside corners**:

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

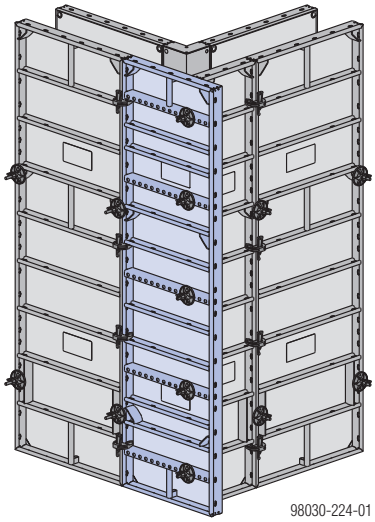
Note:
For details regarding extra inter-panel connections on outside corners (for increased tensile loads), see the section headed "Inter-panel connections for increased tensile loads".

with a Frami Xlife universal panel

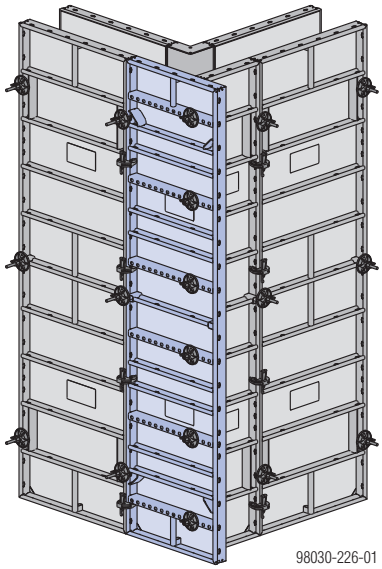
When this panel is used, a wall-thickness grid with 5 cm increments is available.



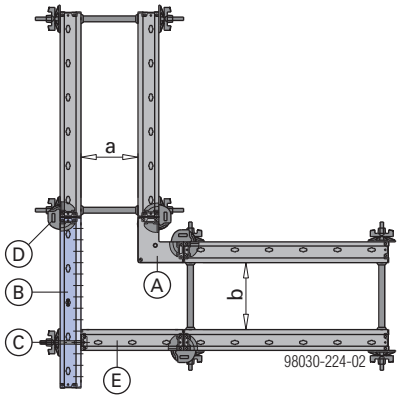
Shown here on Frami Xlife panels 1.50m.



Shown here on Frami Xlife panels 2.70m.



Shown here on Frami Xlife panels 3.00m.

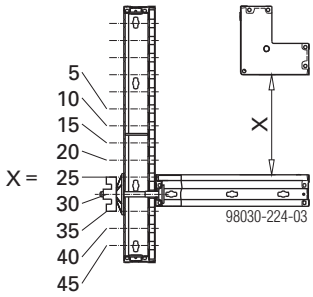


a ... 25 cm
b ... 30 cm

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

Frami Xlife universal panel 0.75m

Attainable wall thicknesses in 5 cm grid:

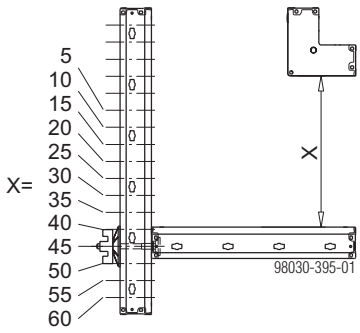


Required numbers of Frami universal fixing bolts + Super-plates 15.0:

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

Achievable wall thicknesses in 5 cm grid:

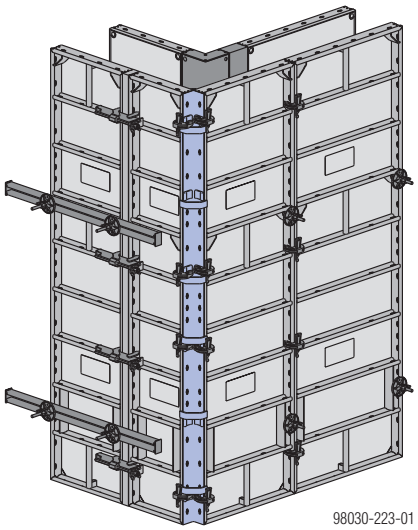


Required numbers of Frami universal fixing bolts + Super plates 15.0:

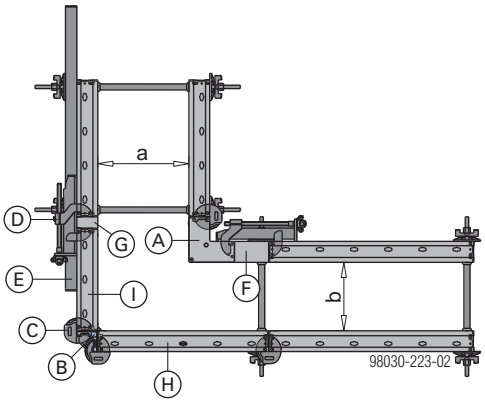
Frami Xlife universal panel 0.90x1.20m	3
Frami Xlife universal panel 0.90x1.50m	3
Frami Xlife universal panel 0.90x2.70m	6
Frami Xlife universal panel 0.90x3.00m	7

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.



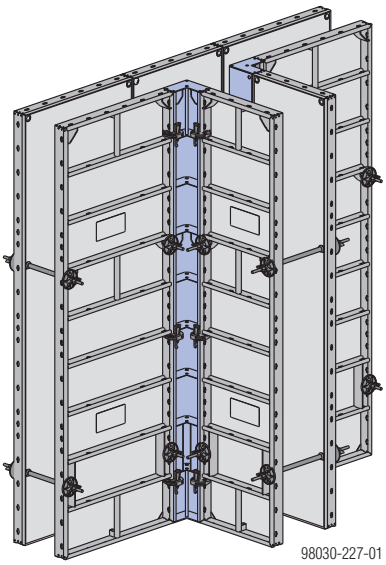
a ... 40 cm
b ... 30 cm

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)

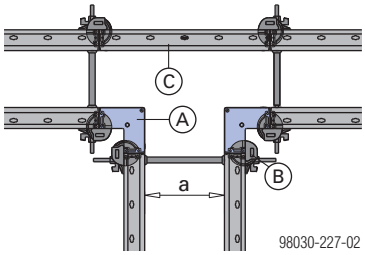
Required numbers of Frami clamps:

	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.



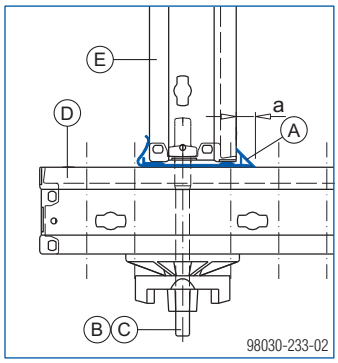
a ... 35 cm

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

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.

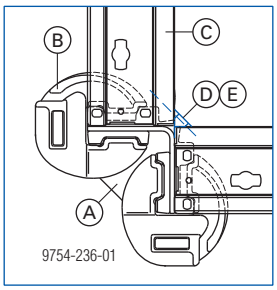


a ... 20 mm

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

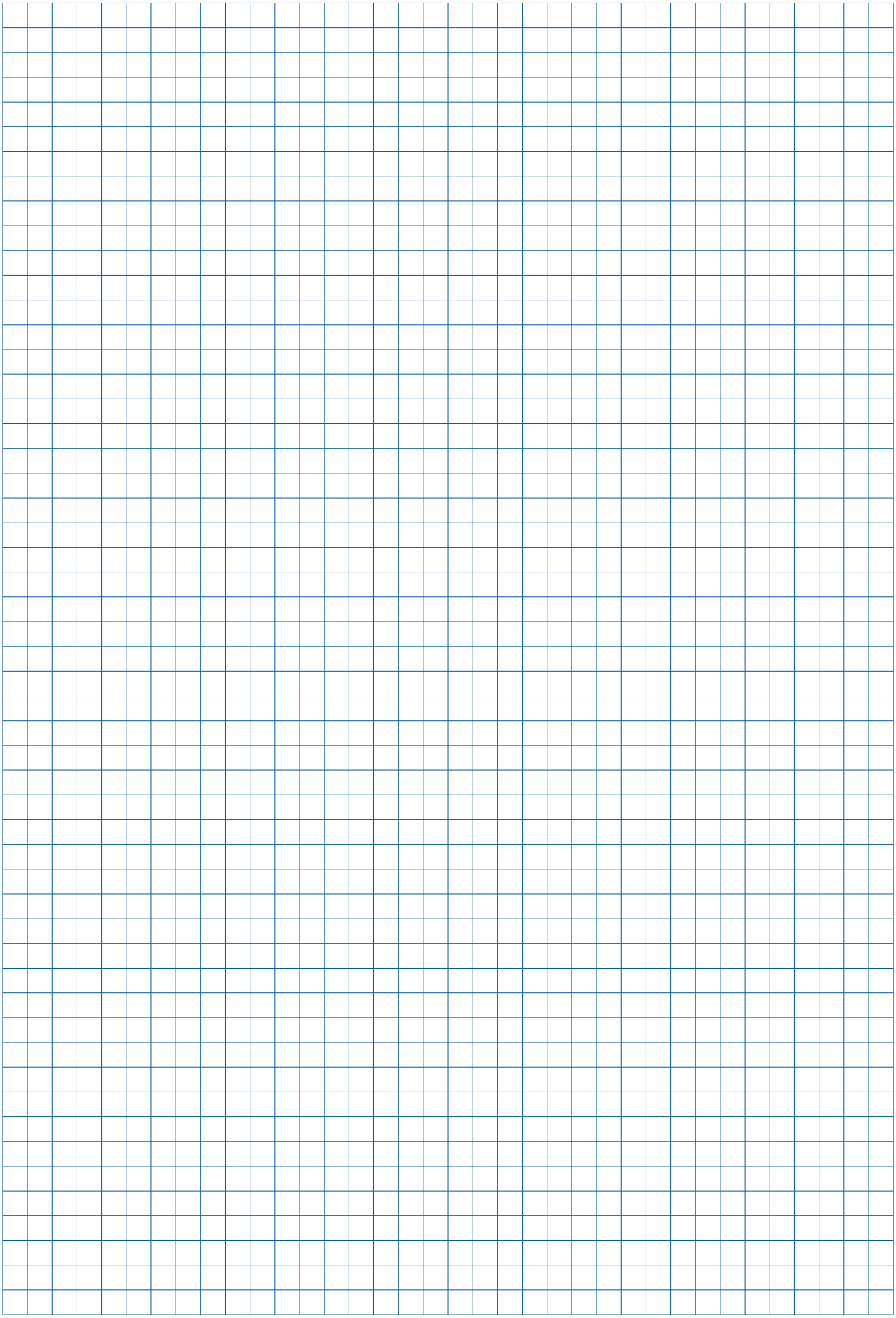
with the Framax triangular ledge

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.



Shaft formwork

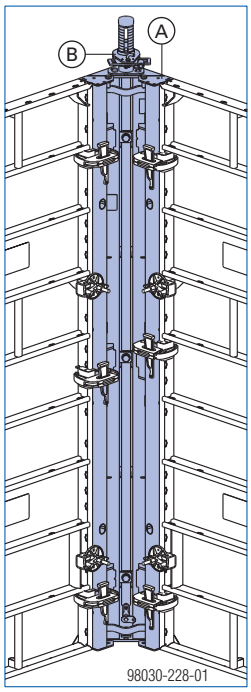
With the **Stripping corner I**, the entire shaft formwork unit is detached from the wall, in one piece, before being lifted and reset by crane.

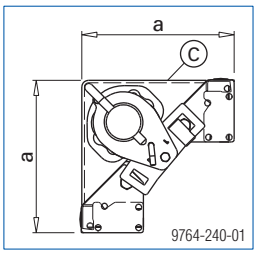
Product features:

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

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

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





a ... 30.0 cm

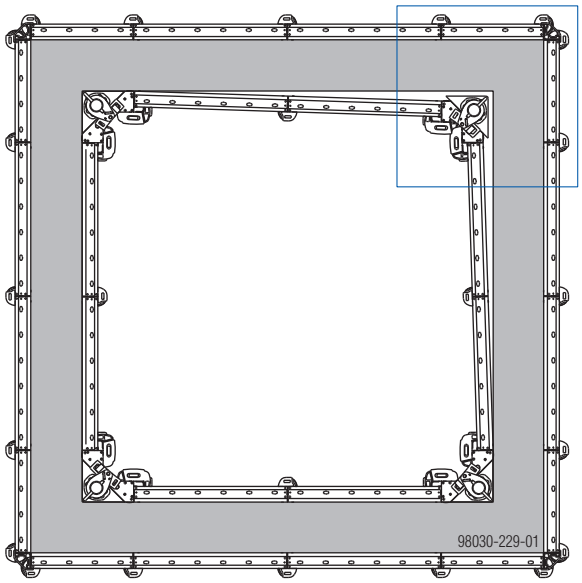
Shown here on Frami Xlife panels 2.70m.

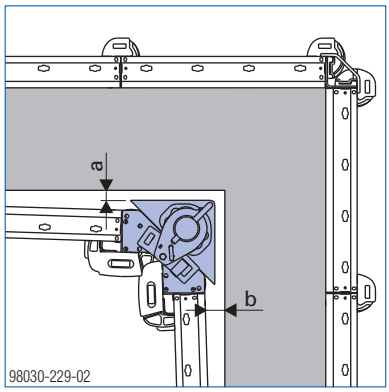
A	Framax stripping corner I
B	Framax stripping spindle I or Framax stripping spindle I with ratchet
C	Steel form-facing

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

- whenever possible, not directly next to the stripping corners

Stripping play:



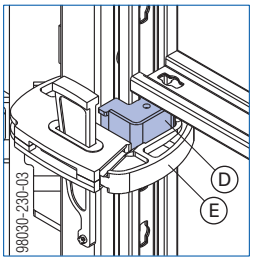


a ... 3.0 cm
b ... 6.0 cm

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

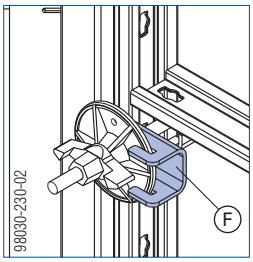
NOTICE

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.

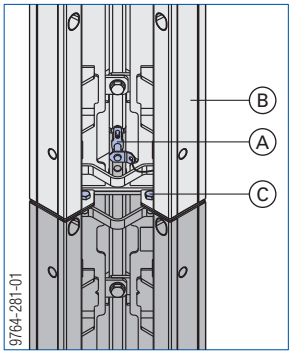
The **difference in thickness between the profiles** is bridged here by the **Frami tie-adapter**.



F Frami tie-adapter for Stripping corner I

Vertical stacking of Framax stripping corners I

1) Pull out the coupling bolt.
2) Manoeuvre the Stripping corner I into place so that it is flush with the one below it.
3) Push the coupling bolt back in.
4) Bolt the Stripping corners I together with 2 hexagonal bolts M16x45.



A Coupling bolt

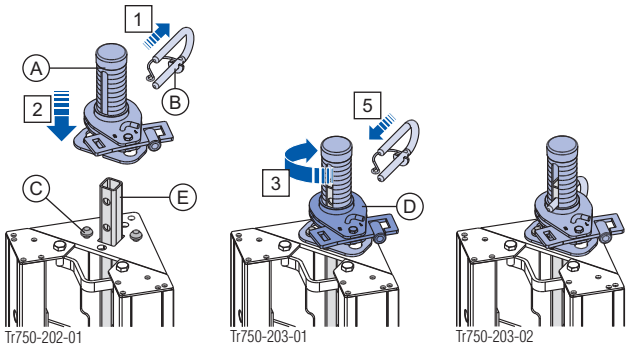
B Stripping corner I

C Hexagonal bolt M16x45

Mounting the Framax stripping spindles I

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

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



A Framax stripping spindle I or
Framax stripping spindle I with ratchet

B U-bolt

C Centering stud of stripping corner

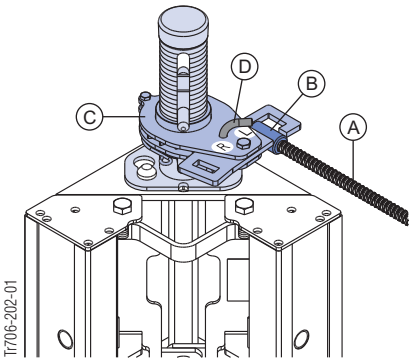
D Ratchet or spindle nut

E Push-rod

Operating the Framax stripping spindle I with ratchet

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

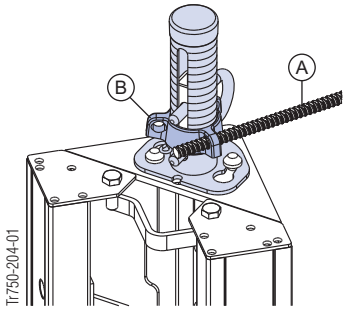
➤ **Stripping**:
- shift the change-over lever into the '**R**' position
- turn the ratchet **anti-clockwise**.



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

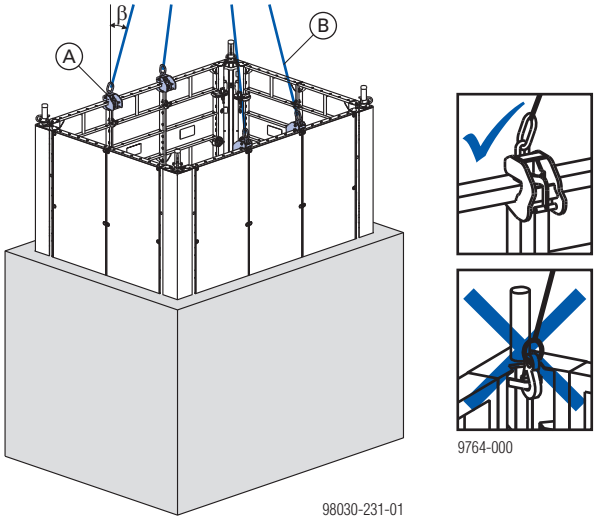
Operating the Framax stripping spindle I

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



A Tie-rod 15.0mm
B Spindle nut

Lifting by crane



β ... max. 15°

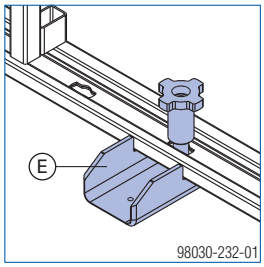
A Frami lifting hook
B Four-part lifting chain (e.g. Doka 4-part chain 3.20m)

The crane hook on the Stripping corner I is not allowed to be used 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 Frami lifting hooks

Doka shaft platform

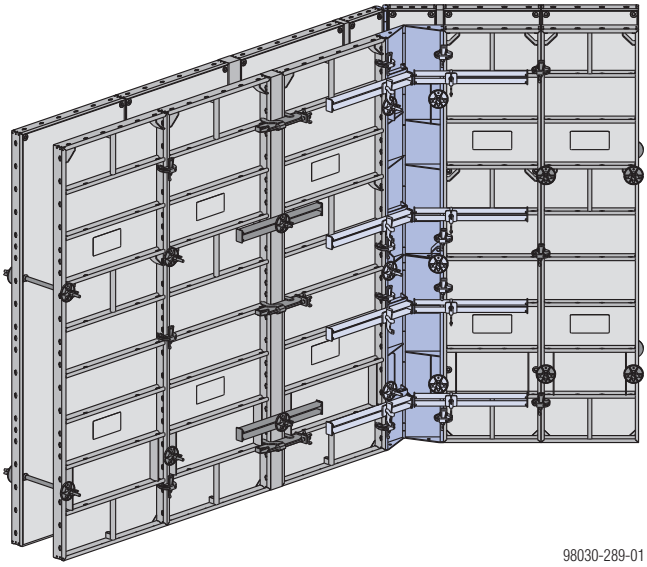
With its telescopic shaft beams, this platform can accommodate any dimension of structure. The inside formwork can be "parked" on the platform and repositioned together with the platform.
The Frami panel shoe provides increased stability on shaft platforms.



E Frami panel shoe

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

Acute & obtuse-angled corners

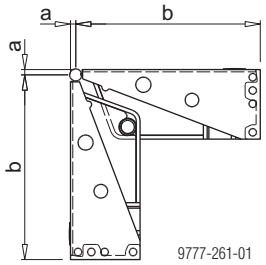


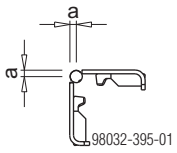
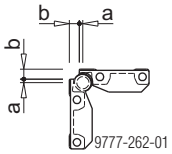
Shown here on Frami Xlife panels 2.70m.

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".

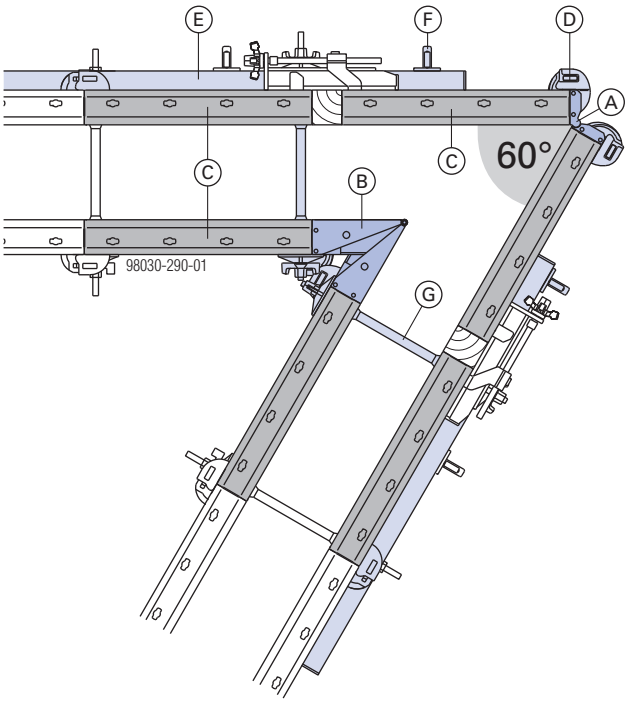
Number of Frami clamps in the hinged outside corner:

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

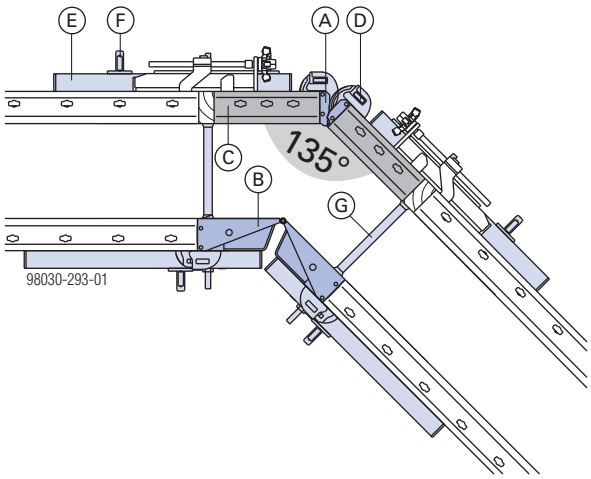
NOTICE

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

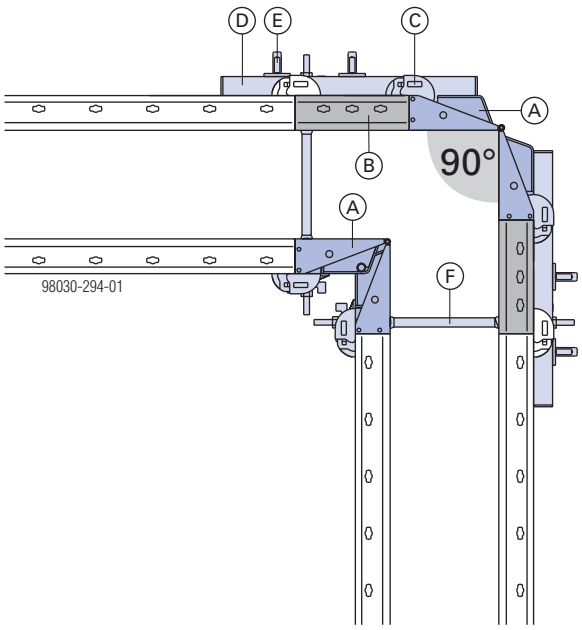


A	Frami hinged outside corner A (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
C	Frami Xlife panel (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
D	Frami clamp
E	Frami universal waling 1.25m
F	Frami wedge clamp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

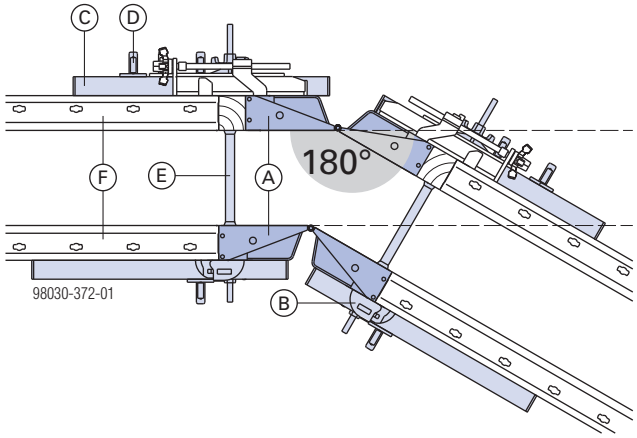


A	Frami hinged outside corner A (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
C	Frami Xlife panel (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
D	Frami clamp
E	Frami universal waling
F	Frami wedge clamp
G	Form-tie

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

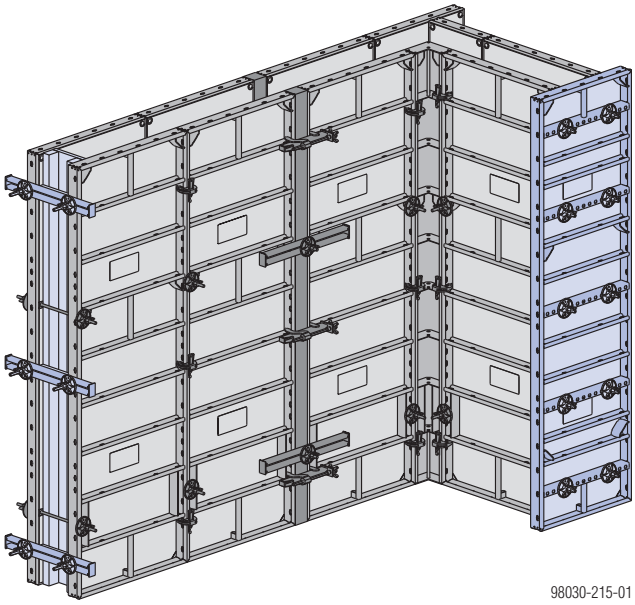


A	Frami hinged inside corner I (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
B	Frami Xlife panel (e.g: 1.20 + 1.50m for a formwork height of 2.70m)
C	Frami clamp
D	Frami universal waling
E	Frami wedge clamp
F	Form-tie



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

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:

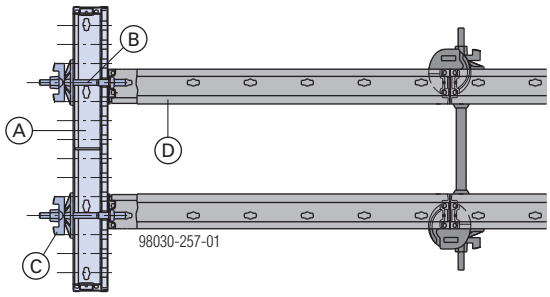
Permitted tensile load:

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

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

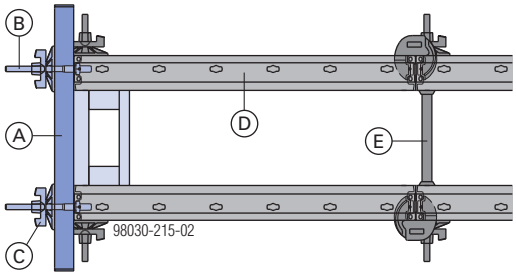
Frami Xlife universal panel 0.90m

The continuous 5 cm hole-grid*) makes it possible to form stop-ends on walls of **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	8
2.70m	12
3.00m	14

with universal walings



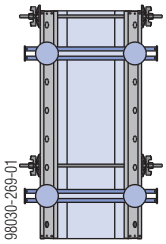
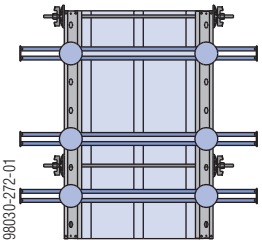
A	Frami universal waling
B	Frami universal fixing bolt 5-12cm or Frami corner connector
C	Super-plate 15.0
D	Frami Xlife panel
E	Form-tie

Frami universal waling:
Permitted moment: 1.3 kNm

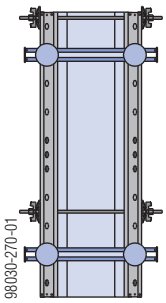
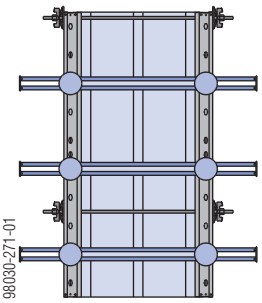
The universal waling makes it possible to precision-form continuously adjusted stop-ends across any wall thickness. The Universal walings are mounted using Universal fixing bolts 5-12cm or Corner connectors and Super-plates 15.0.

Number and position of universal walings:

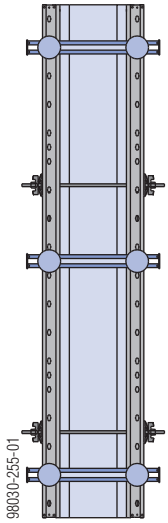
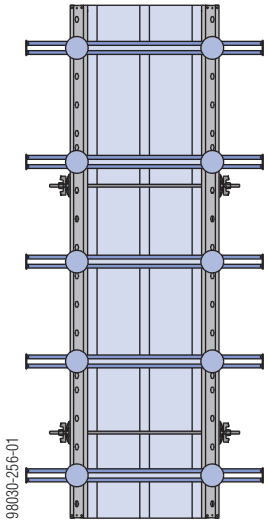
Panel height **1.20m**

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

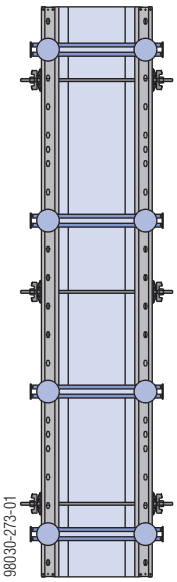
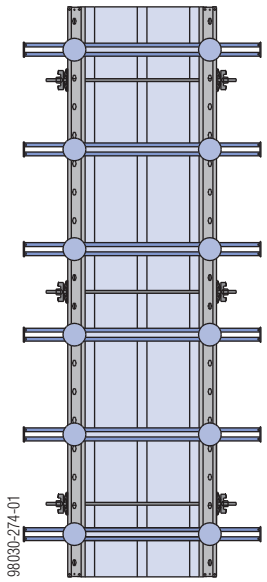
Panel height **1.50m**

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

Panel height **2.70m**

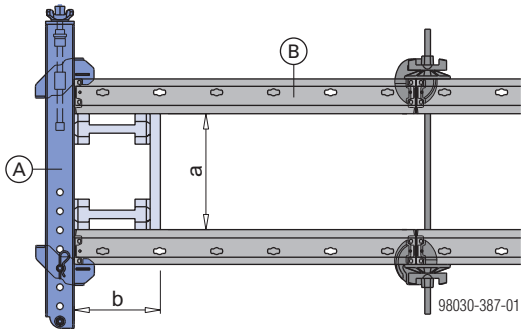
Up to wall thickness **38 cm**	Up to wall thickness **60 cm**
	
3 universal walings	5 universal walings

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.

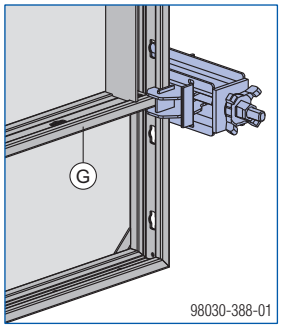


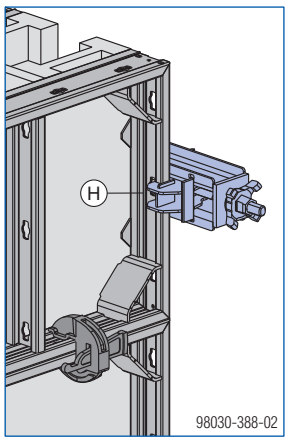
a ... 15 cm to 45 cm
b ... ≥ 20 cm (only statically necessary on panel width 0.90m)

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

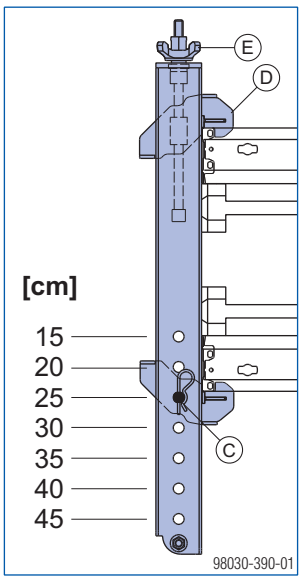




G Cross profile
H Middle of panel

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:

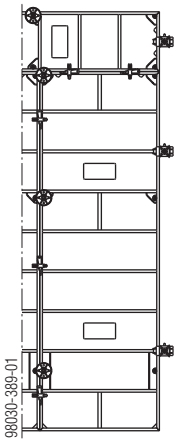
Panel height (upright panels)	Frami stop-end waler ties
1.20m	2
1.50m	2
2.70m	2
3.00m	3

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

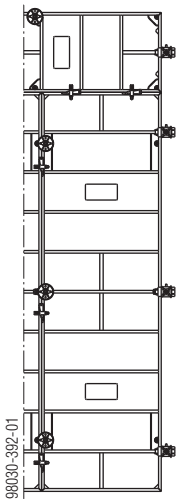
*) On single panels not forming part of a gang (e.g. when being used as foundation formwork), at least 2 stop-end waler ties must be used.

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)



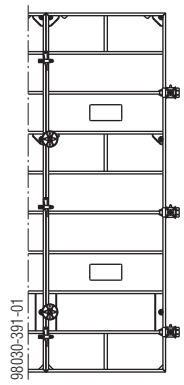
Fresh-concrete pressure $\sigma_{hk, max, hydr}$ = 67.5 kN/m²

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



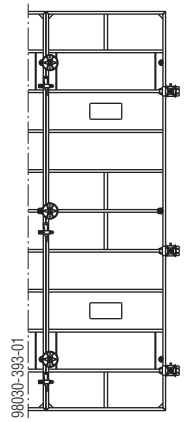
Fresh-concrete pressure $\sigma_{hk, max}$ = 60 kN/m²

Required numbers of stop-end waler ties:

Panel height	Frami stop-end waler ties
3.00m	3

Positions of the stop-end waler ties:

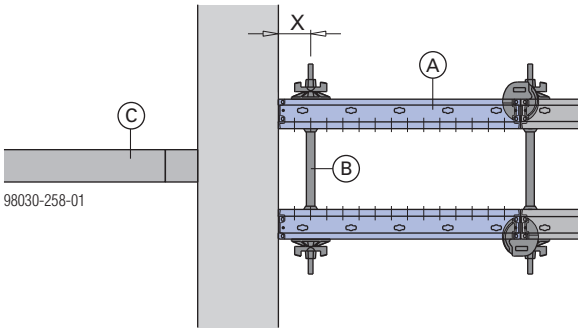
Formwork height = panel height 3.00m



Wall junctions

Right-angled connections

with a Frami Xlife universal panel



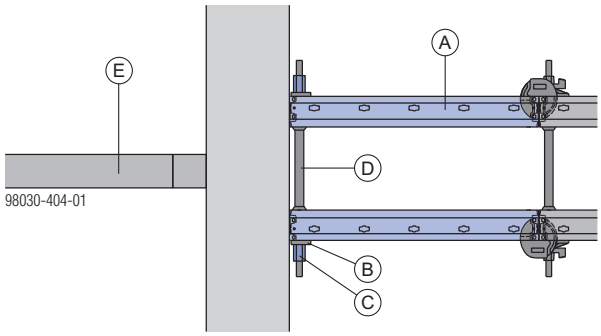
X ... max. 25 cm

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

Number of form-ties in Universal panel:

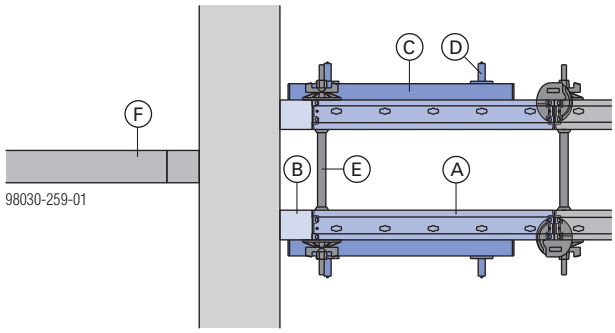
		Panel width	
		0.75m	0.90m
Panel height	1.20m	2	3
	1.50m	3	4
	2.70m	5	6
	3.00m	6	7

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

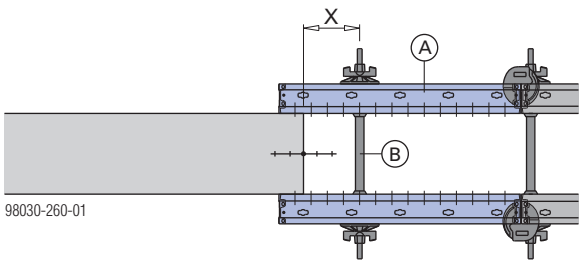
with Frami Xlife panels and squared timbers



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



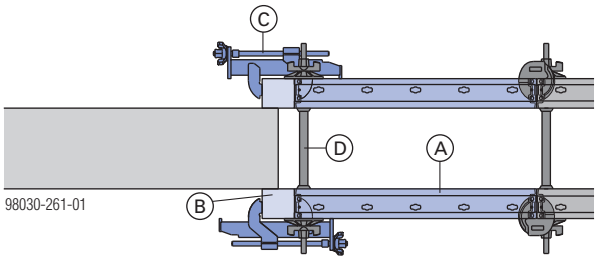
X ... max. 25 cm

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

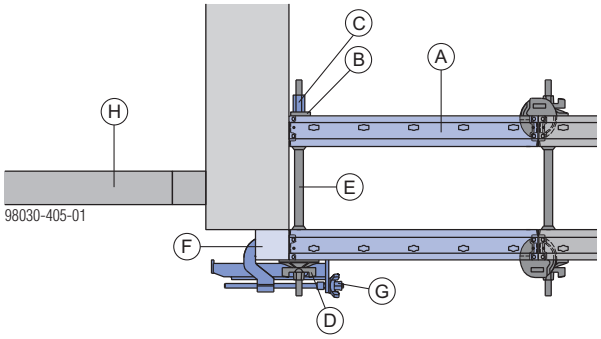
with Frami Xlife panels and squared timbers



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

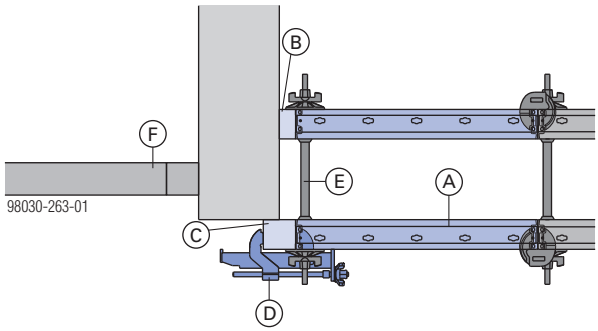
Corner connections

without closure

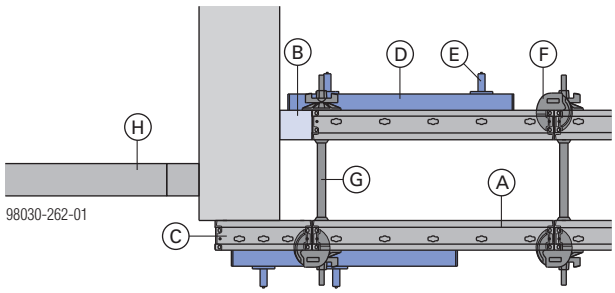


A Frami Xlife panel
B Frami pressure plate 8/9
C Hexagon nut 15.0
D Super plate 15.0
E Doka tie rod system 15.0mm
F Squared timber
G Adjustable clamp
H In-place timber brace

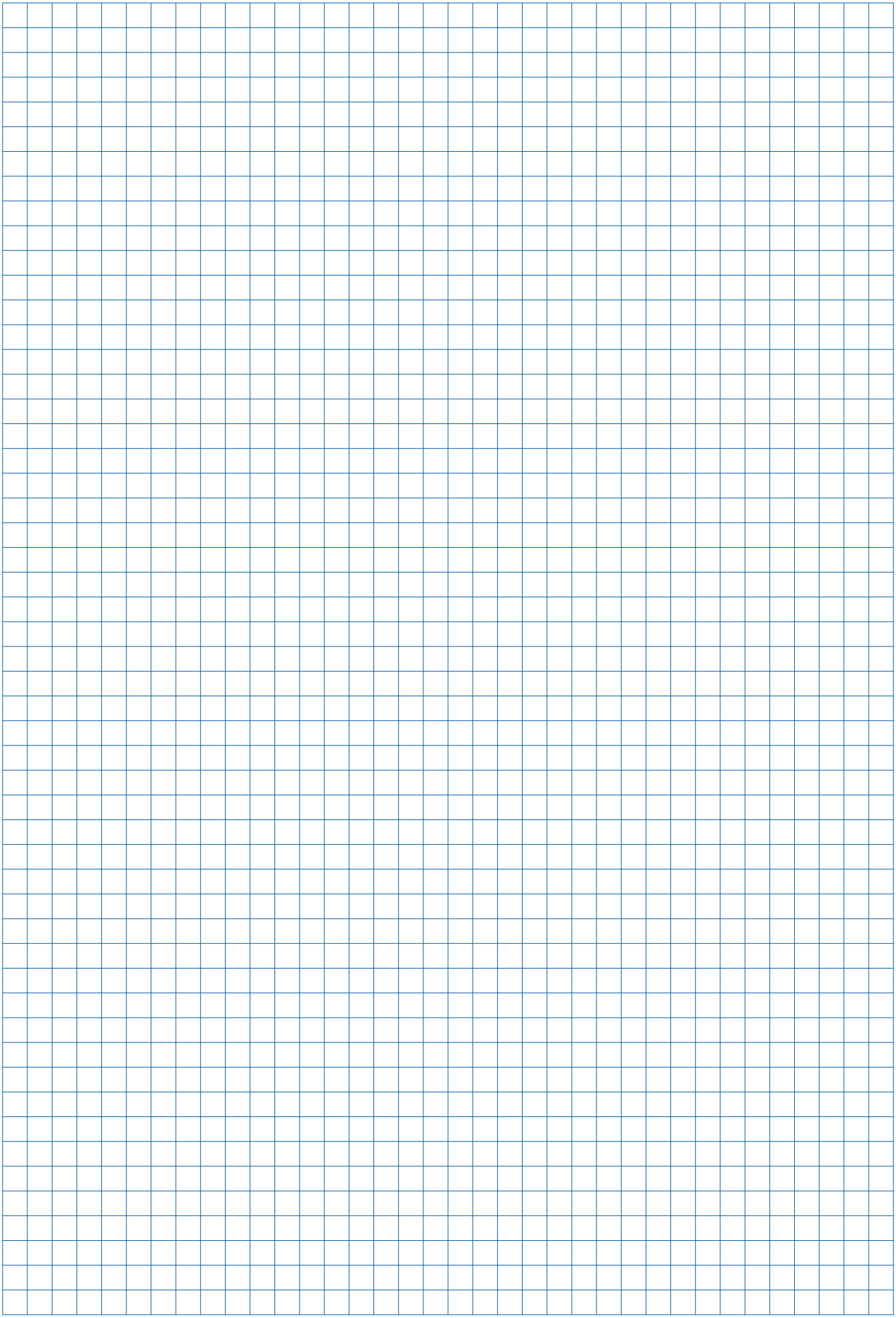
with closure



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

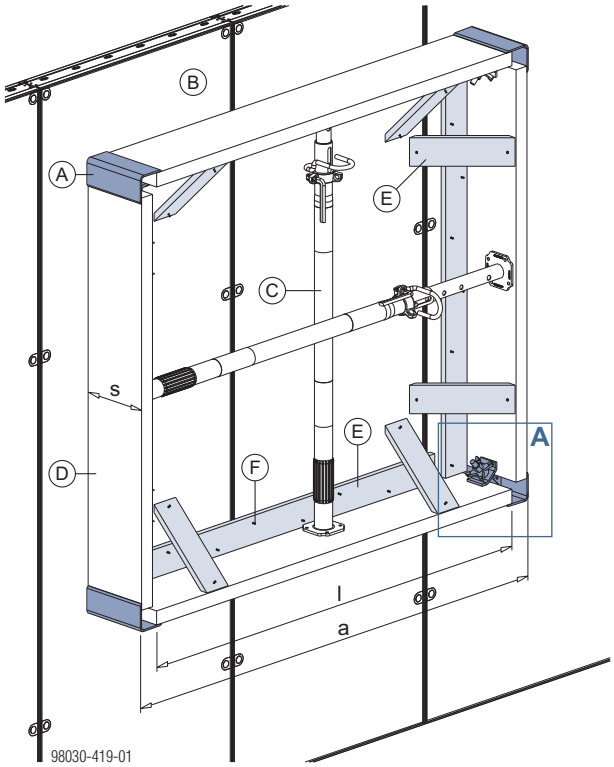


A Frami Xlife panel
B Squared timber (min. 3 cm up to max. 10 cm)
C Frami Xlife panel 0.30m
D Universal walings (not needed if the squared timber is less than 5 cm wide)
E Frami wedge clamp
F Frami clamp
G Form-tie
H In-place timber brace

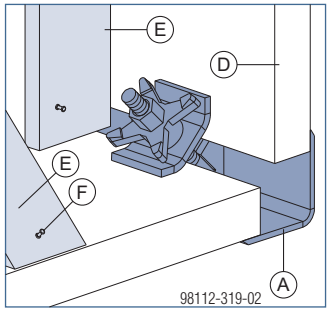


Window and door openings

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).

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

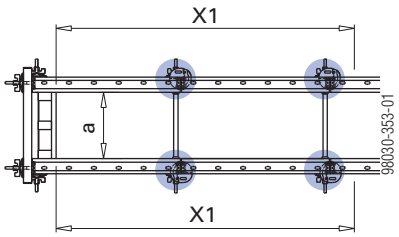
Where **increased tensile loads** need to be sustained near outside corners and stop-ends, **extra clamps are needed**.

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

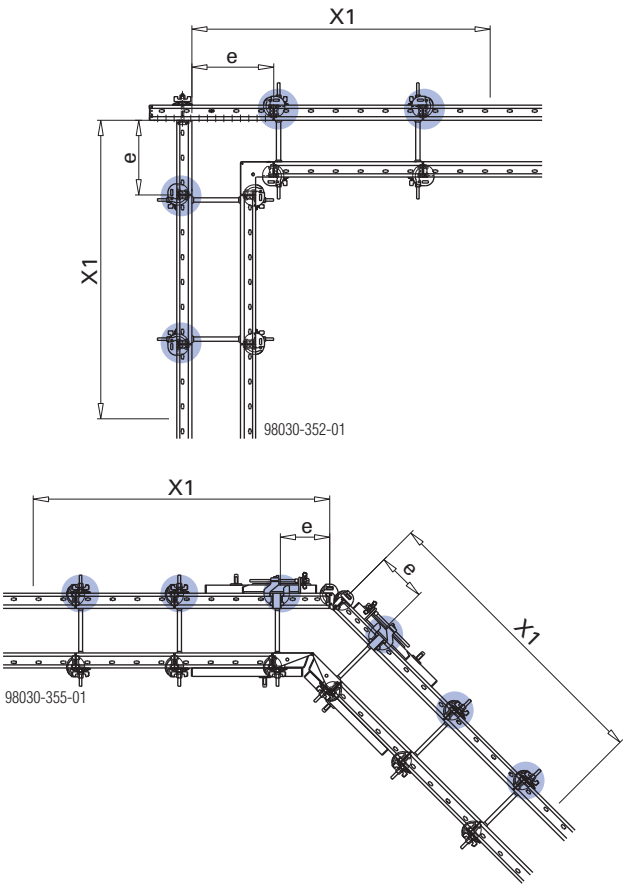


a ... 40 to 70 cm

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

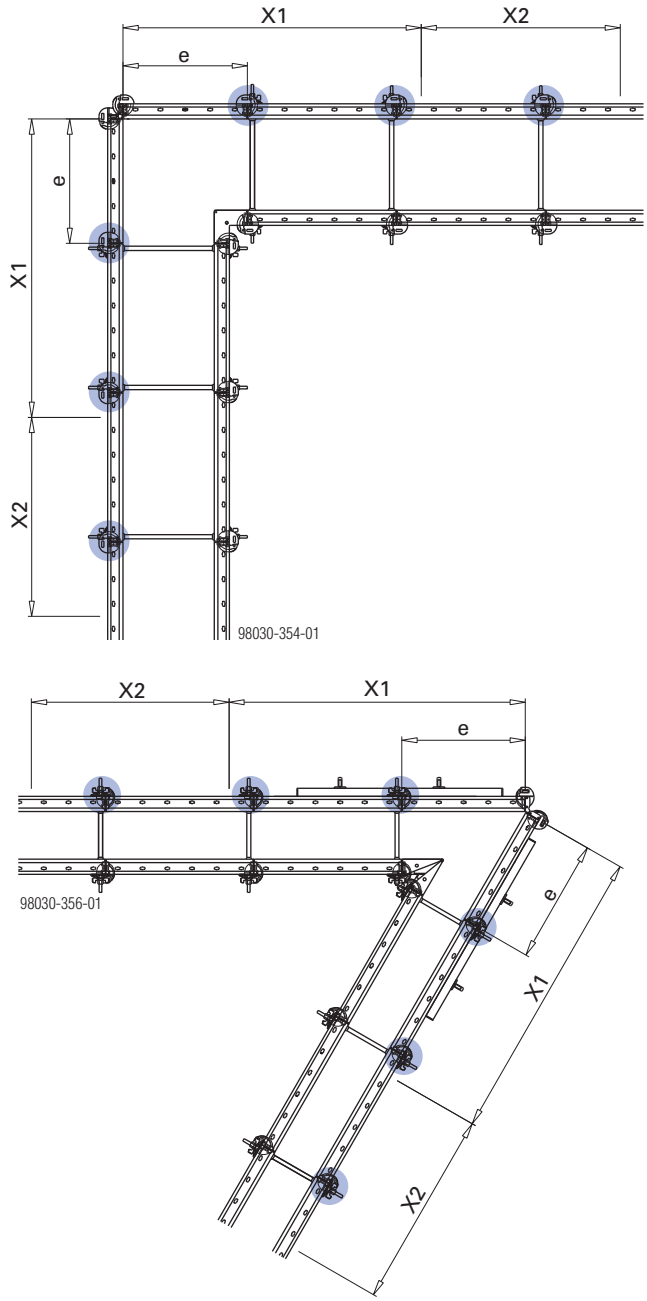
for panel widths up to 60 cm



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**

Vertical stacking of panels

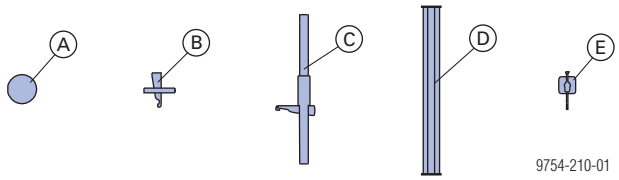
Positions of the interconnecting and form-tie components and accessories needed for:

- 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

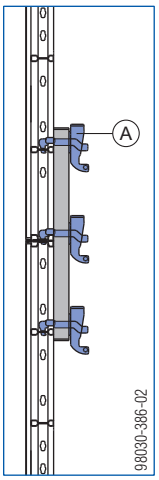
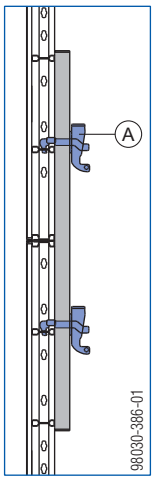
Frami universal waling:
Permitted moment: 1.3 kNm



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.

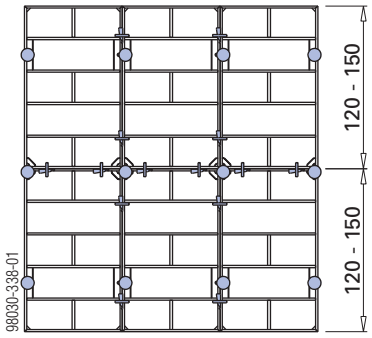
Fixing universal walings to the panel joint

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

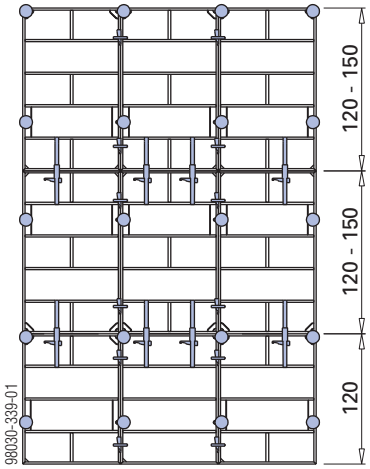
with Xlife panel 1.20 and 1.50m

Formwork height: 240, 270 and 300 cm

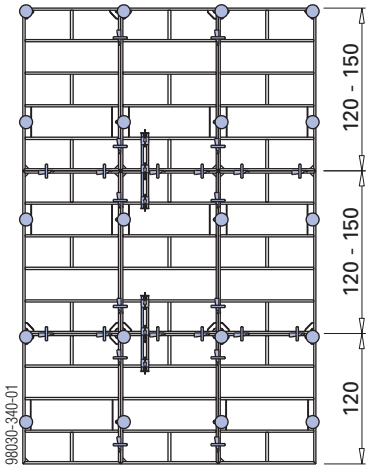


Formwork height: 360, 390 and 420 cm

Variant using aligning clamp

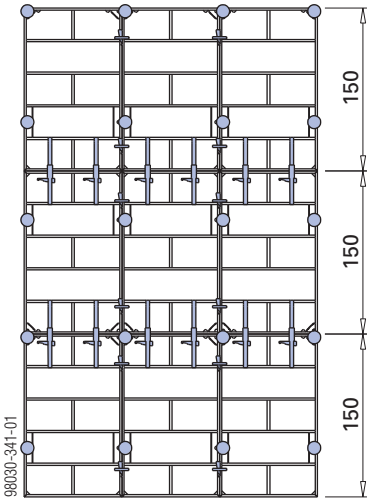


Variant using Frami clamp and universal waling

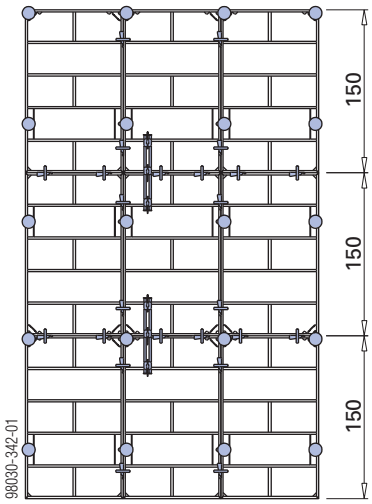


Formwork height: 450 cm

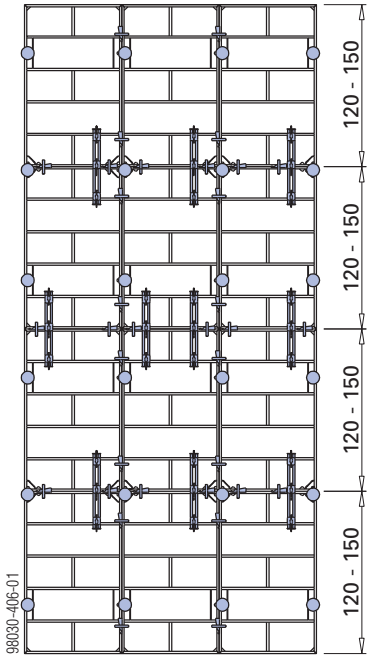
Variant using aligning clamp



Variant using Frami clamp and universal waling

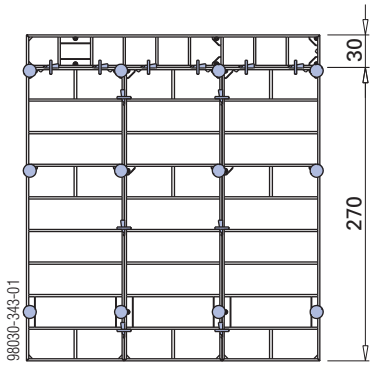


Formwork height: 480, 510, 540, 570 and 600 cm

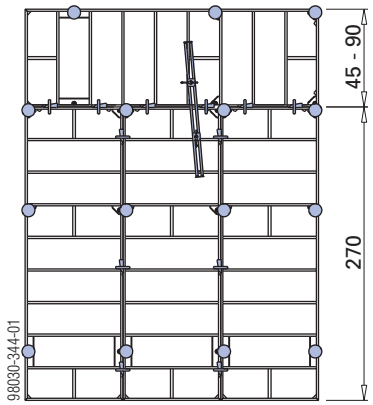


with Xlife panel 2.70m

Formwork height: 300 cm

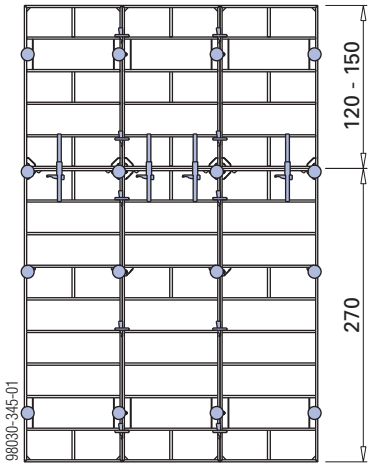


Formwork height: 315, 330, 345 and 360 cm

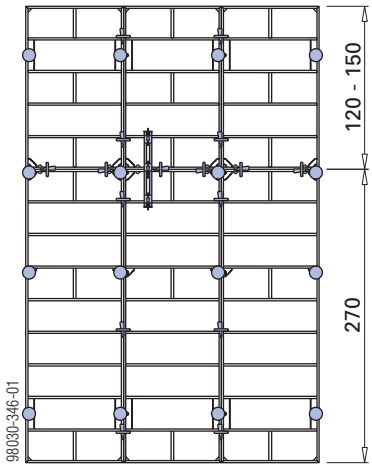


Formwork height: 390 and 420 cm

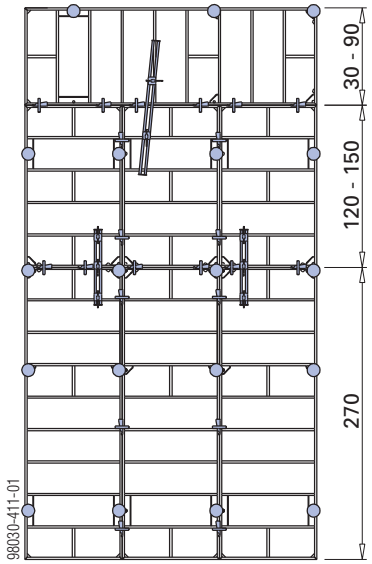
Variant using aligning clamp



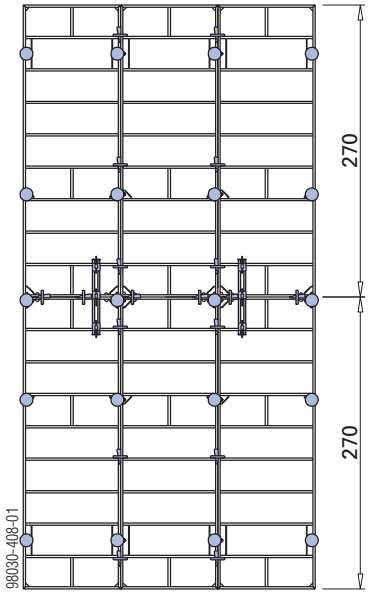
Variant using Frami clamp and universal waling



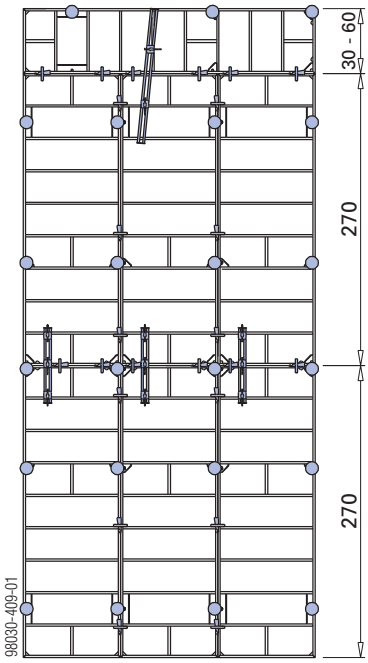
Formwork height: 420, 435, 450, 465, 480, 495 and 510 cm



Formwork height: 540 cm

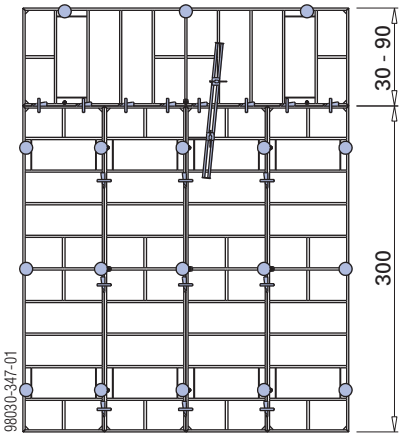


Formwork height: 570 and 600 cm



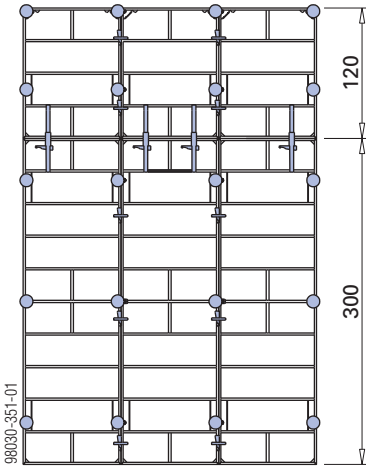
with Xlife panel 3.00m

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

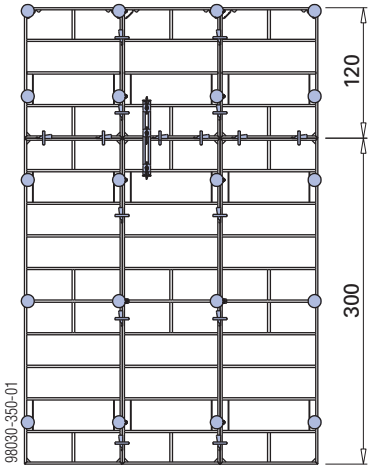


Formwork height: 420

Variant using aligning clamp

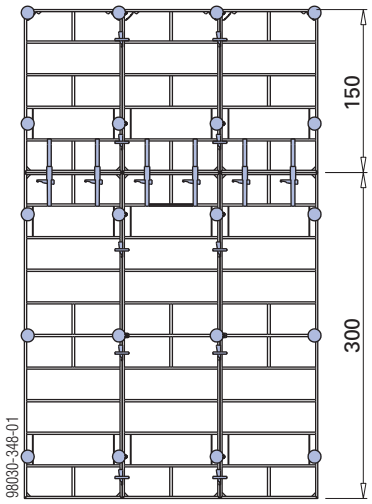


Variant using Frami clamp and universal waling

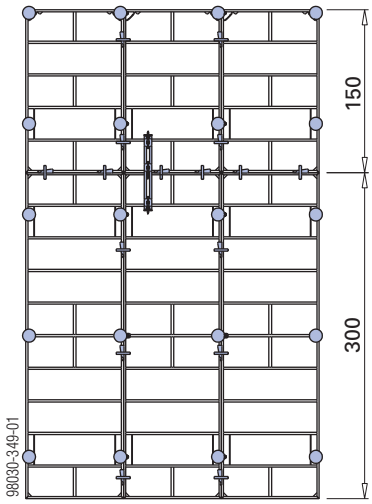


Formwork height: 450 cm

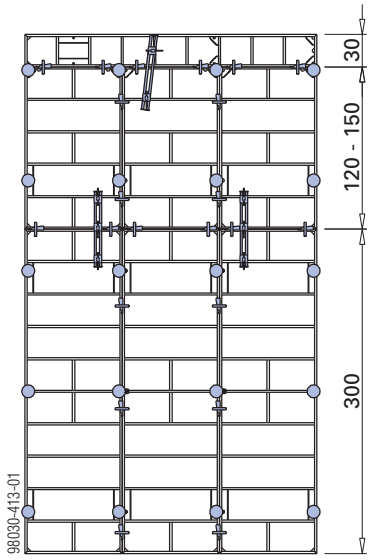
Variant using aligning clamp



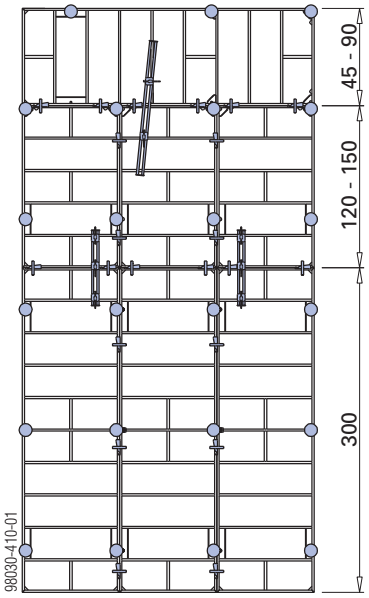
Variant using Frami clamp and universal waling



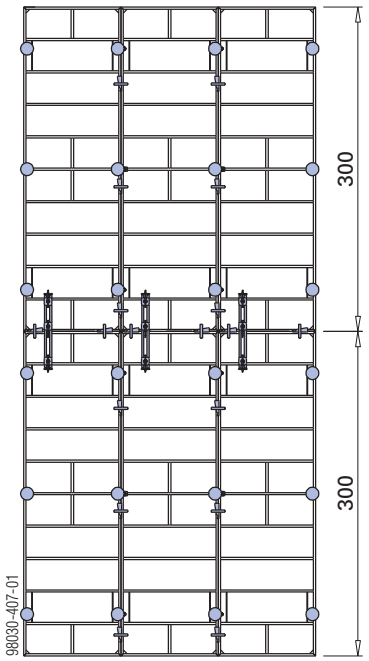
Formwork height: 450 and 480 cm



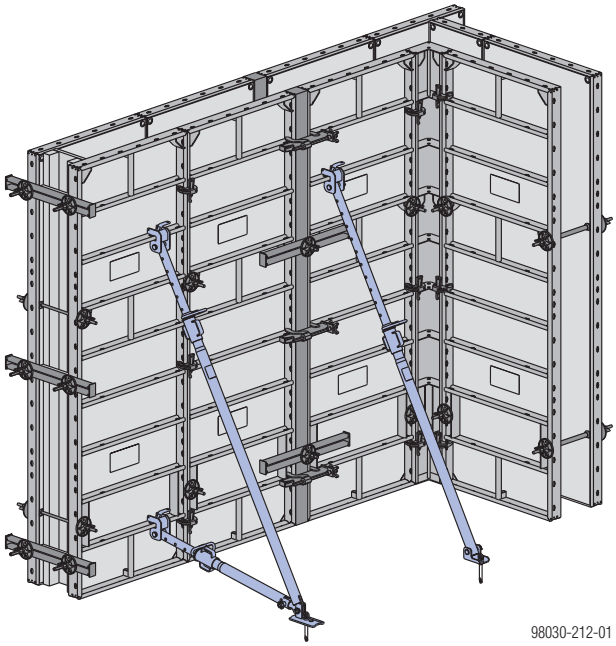
Formwork height: 465, 480, 495, 510 and 540 cm



Formwork height: 600 cm



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.

Product features:

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

NOTICE

The formwork panels must be held stable in **every** phase of the construction work!

Please observe all applicable safety regulations!

CAUTION

There is a risk of the formwork tipping over **in high winds**.

➤ 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

Structural design

The values apply where the wind pressure w_e = 0.65 kN/m². This results in a dynamic 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 constructionally sustained 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 ask your Doka technician!

Note:

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

Plumbing strut 260 + strut head:

Formwork height [m]	Permissible spacing [m]
1.80	2.10
2.25	1.90
2.70	1.35
3.00	1.20
3.60	0.80
Max. anchoring load: F_k = **4.5 kN** (R_d = **6.8 kN**)	

Panel strut 340 + strut head:

Formwork height [m]	Permissible spacing [m]
2.70	1.45
3.00	1.35
3.60	1.00
4.20	0.95
4.50	0.70
Max. anchoring load: F_k = **4.5 kN** (R_d = **6.8 kN**)	

Plumbing strut 260 + Frami connection profile:

Formwork height [m]	Connection height [m]	Permissible spacing [m]
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_k = **15.8 kN** (R_d = **23.7 kN**)		

Panel strut 340 + Frami connection profile:

Formwork height [m]	Connection height [m]	Permissible spacing [m]
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
Max. anchoring load: F_k = **13.5 kN** (R_d = **20.3 kN**)		

Panel strut 540 + Frami connection profile:

Formwork height [m]	Connection height [m]	Permissible spacing [m]
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_k = **13.5 kN** (R_d = **20.3 kN**)		

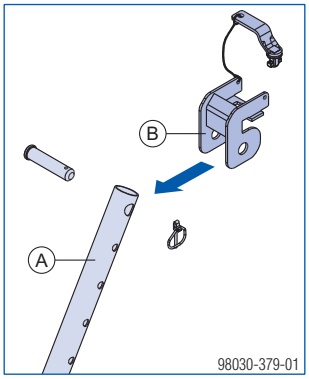
Example: Where the formwork height is 3.00 m, the following are needed for every 5.40 m wide gang-form:

- 5 plumbing struts 260 + strut heads
  or
- 4 panel struts 340 + strut heads
  or
- 3 plumbing struts 260 + Frami connection profiles
  or
- 2 panel struts 340 + Frami connection profiles

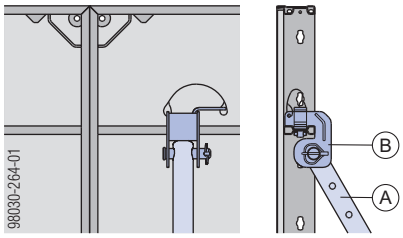
Fixing the struts to the formwork

with the Strut head EB

➤ Fit strut heads to the panel strut or plumbing strut.



➤ Pin the strut head into the holes in the **cross profiles (frame profiles)**.

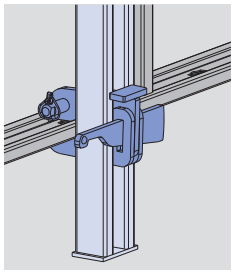
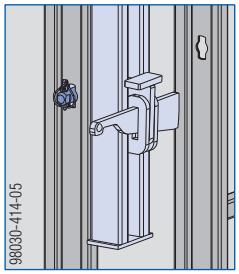


A Panel strut 340 IB or Plumbing strut 260 IB
B Strut head EB

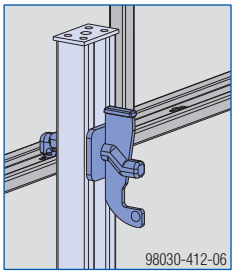
with the Frami connection profile EB

Advantages:
- Larger spacings of the plumbing accessories.
- On vertically stacked panels (panel joint), the Frami connection profile takes over the function of the universal waling.

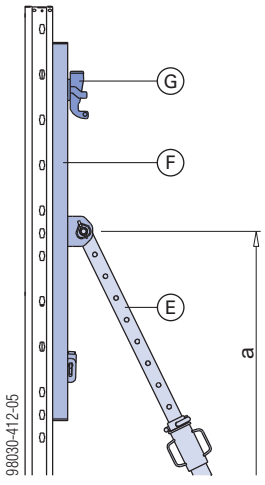
➤ Position the Frami connection profile on the Frami panel, and fix it to the cross profile by means of the integrated wedge clamp or the integrated bolt.

Wedge clamp	Bolt
	

➤ Fix the other end of the Frami connection profile to the cross profile or frame profile with another Frami wedge clamp.



➤ Fix a panel strut or plumbing strut to the Frami connection profile.

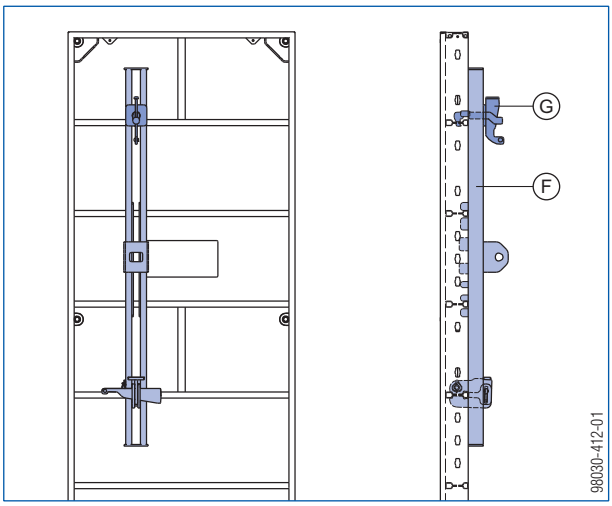


a ... Connection height

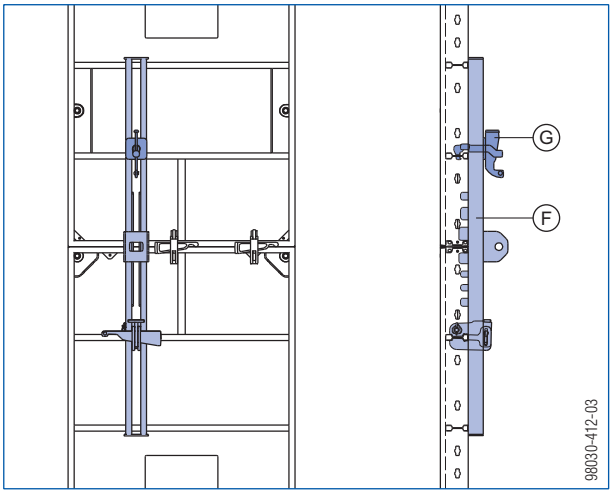
E Panel strut 340 IB or 540 IB or Plumbing strut 260 IB
F Frami connection profile EB
G Frami wedge clamp

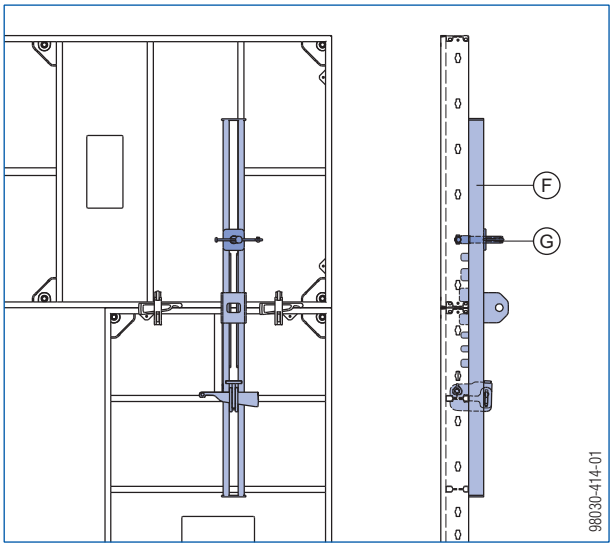
Possible positions of the Frami connection profile

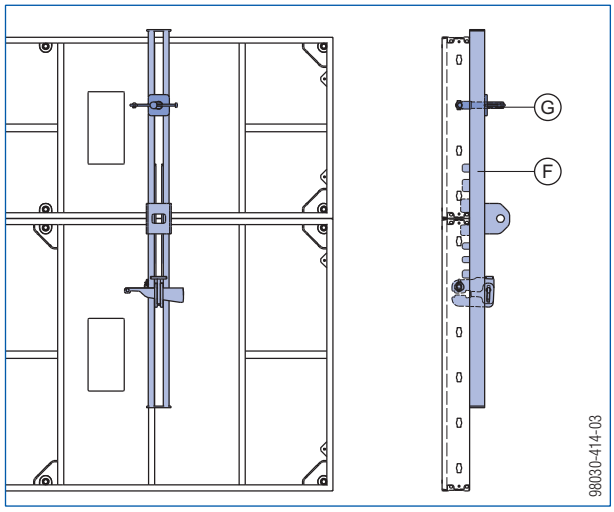
on the cross profiles of the Frami Xlife panels:



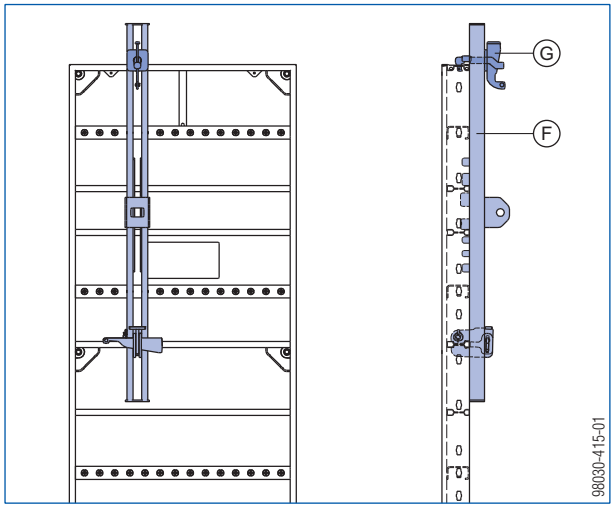
over a panel joint of the Frami Xlife panels: (same function as universal waling)

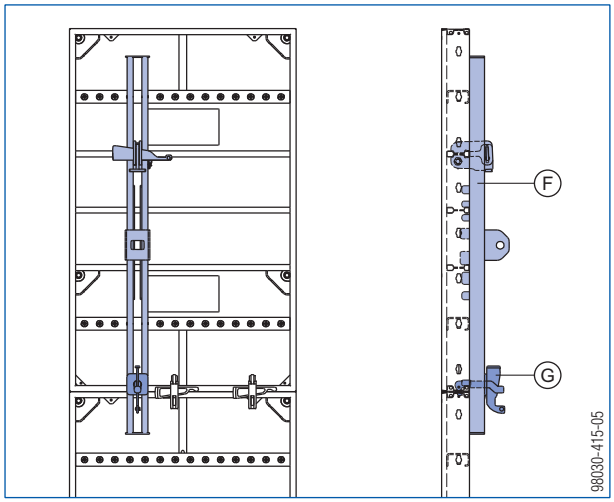




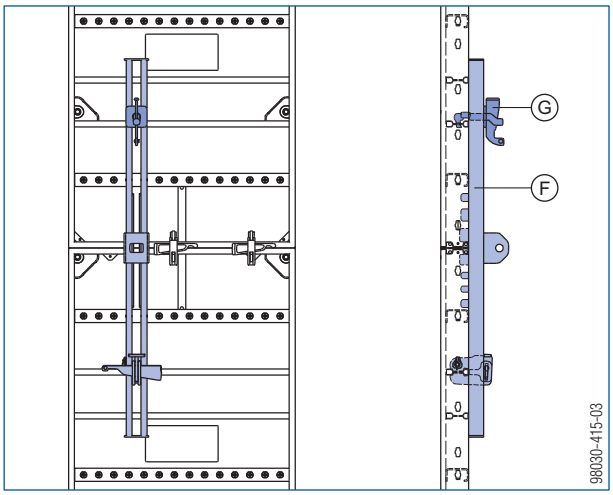


on the cross profiles of the Frami Xlife universal panels:





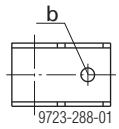
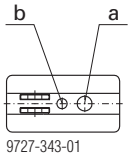
over a panel joint of the Frami Xlife universal panels:
(same function as universal waling)



Fixing to the ground

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

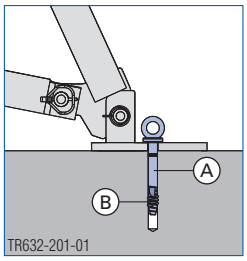
Drilled holes in the footplates

Plumbing strut 260	Panel struts
	

a ... ⌀ 26 mm
b ... ⌀ 18 mm

Anchoring the footplate

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



A Doka express anchor 16x125mm
B Doka coil 16mm

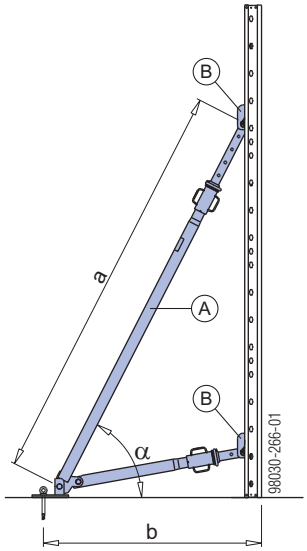
Characteristic cube compressive strength of the concrete ($f_{ck,cube}$):
min. 15 N/mm² (C12/15 grade concrete)

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.

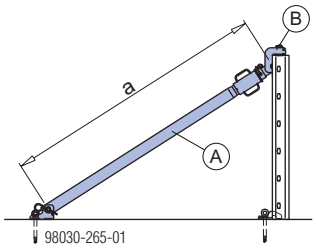
Panel strut 340

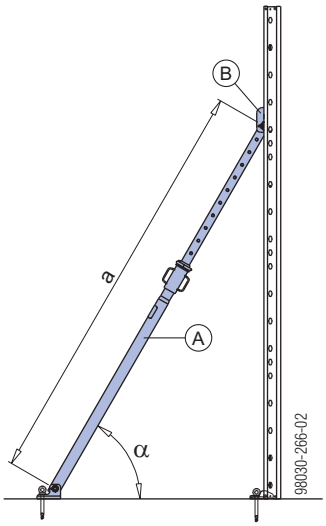


a ... min. 191 cm, max. 341 cm
b ... min. 108 cm, max. 157 cm
α ... approx. 60°

A Panel strut 340 IB
B Strut head EB

Plumbing strut 260

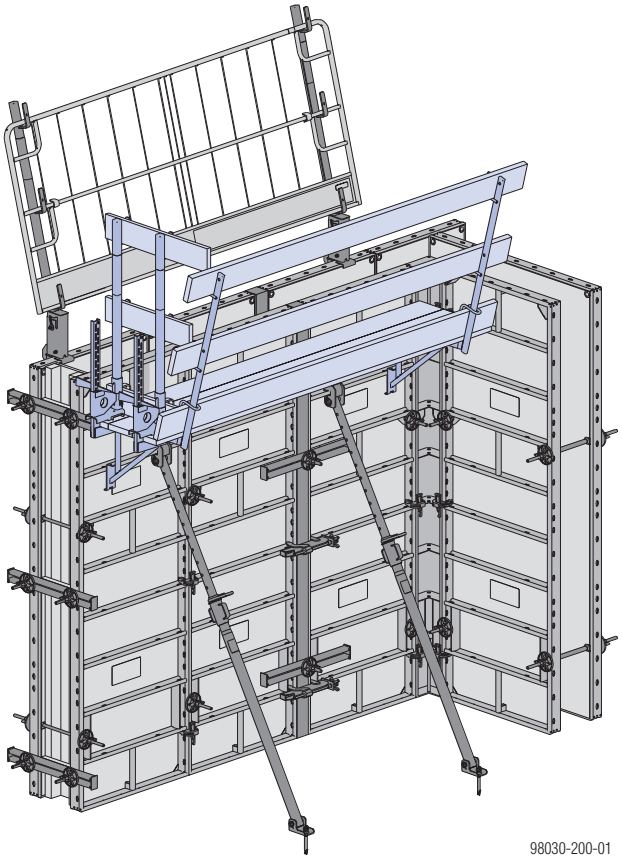




a ... min. 147 cm, max. 256 cm
α ... approx. 60°

A Plumbing strut 260 IB
B Strut head EB

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

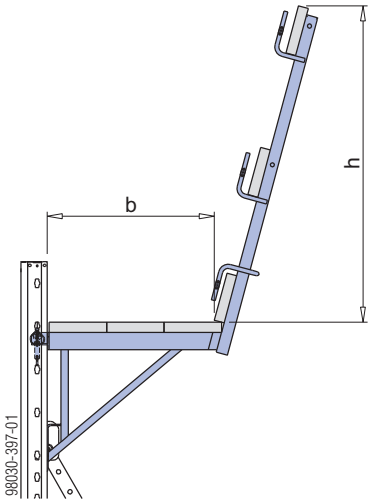
Note:

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 can be used to assemble 60 cm wide pouring platforms that are easy to mount by hand.



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

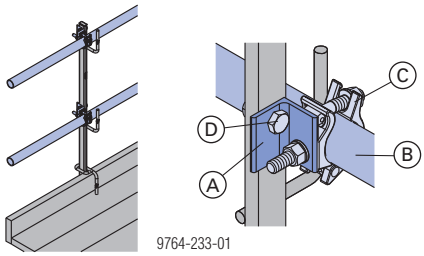
Board thicknesses for support centres of up to 2.50 m:

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

Fastening the deck-boards: Use 3 square bolts M 10x120 per bracket (not included in scope of supply)

Fastening the guard-rail boards: Use nails

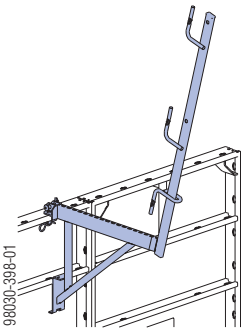
Using scaffolding tubes



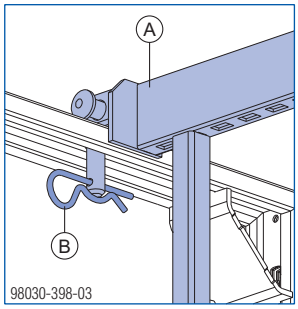
Tools: Fork spanner 22 for mounting the couplers and scaffolding tubes.

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

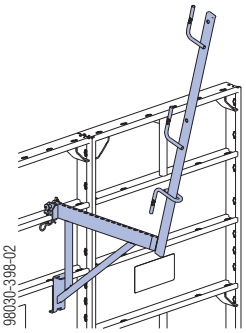
Possible ways of fixing to upright panels



In the frame profile



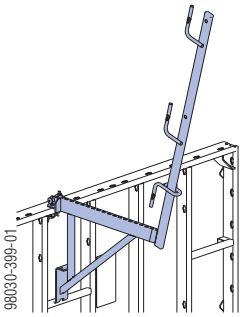
Lift-out guard



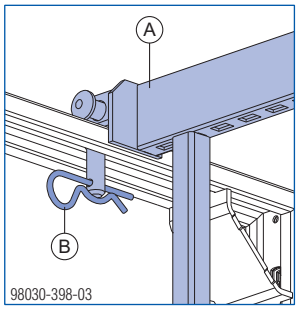
In the cross profile

A	Frami bracket 60
B	Spring cotter

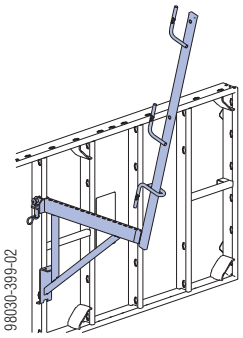
Possible ways of fixing to horizontally placed panels



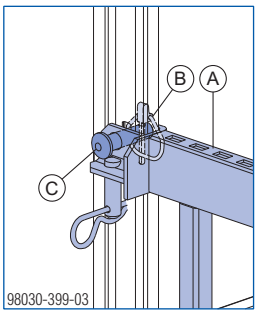
In the frame profile



Lift-out guard



In the cross profile



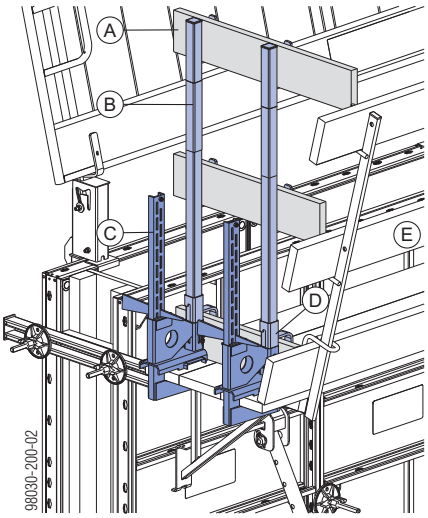
Lift-out guard

A	Frami bracket 60
B	Spring cotter
C	Fastening pin with linch pin

Sideguards on exposed platform-ends

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

Edge protection system XP



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

How to mount:

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

Handrail clamp S

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

Opposing guard-rail

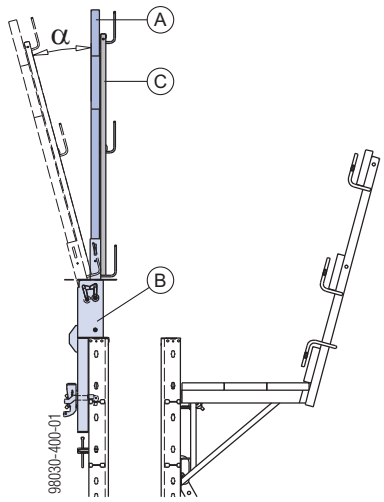
If there are work platforms mounted on one side of the formwork only, then a fall-protection barrier must be mounted to the opposing formwork.

Note:

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

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

Edge protection system XP



α ...15°

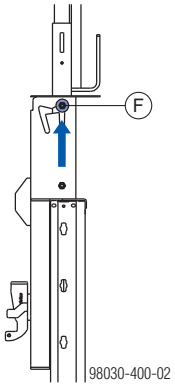
A Handrail post XP 1.20m

B Frami adapter XP

C Protective grating XP or guard-rail boards

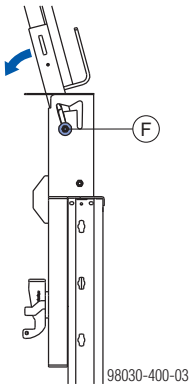
If necessary (e.g. to enlarge the available work-space during pouring), the safety barrier can be tilted outward by 15°.

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



F Safety bolt

➤ Tilt the safety barrier outward.

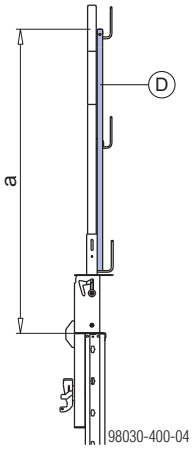
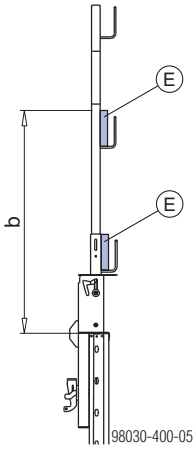


F Safety bolt

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	Guard-rail boards
	

a ... 143 cm
b ... 103 cm

D Protective grating XP

E Guard-rail board

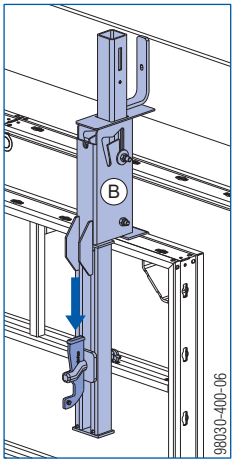
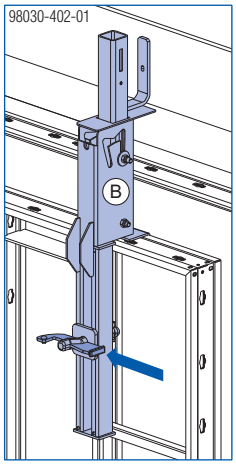
NOTICE

When guard-rail boards are used to make the safety barrier, it is not allowed to fit guard-rail 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.

Upright Frami panel:	Horizontal Frami panel:
	

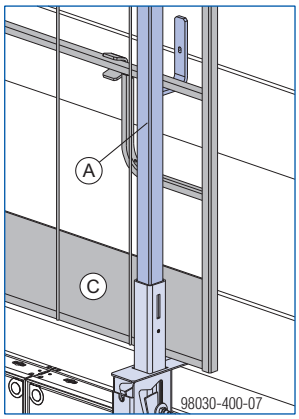
B Frami adapter XP

Make sure that the adapter is fitted on correctly and is resting solidly on the frame profile!

➤ Push the Handrail post XP 1.20m into the post-holding fixture on the Frami adapter XP until the locking mechanism engages.

➤ Fit on a Protective grating XP or guard-rail boards.

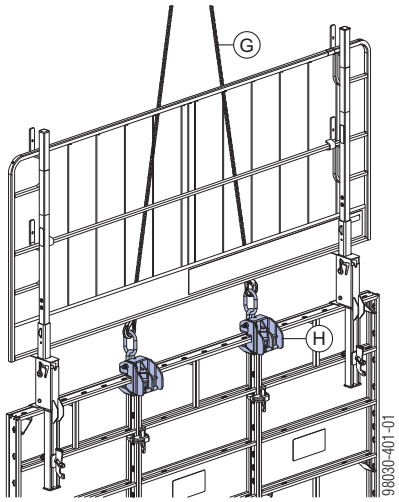
➤ Fix the Protective grating XP to the Handrail post XP with Velcro® fasteners 30x380mm, or fix on the guard-rail boards with nails (diam. 5 mm).



A Handrail post XP 1.20m

C Protective grating or guard-rail boards

Lifting by crane

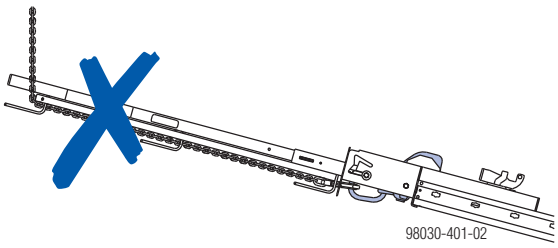


G Doka 4-part chain 3.20m

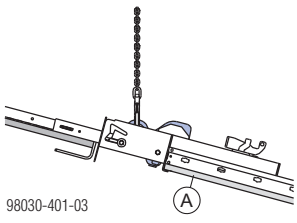
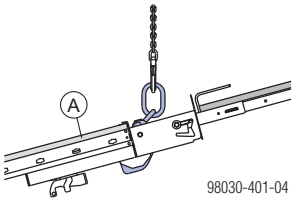
H Frami lifting hook

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.

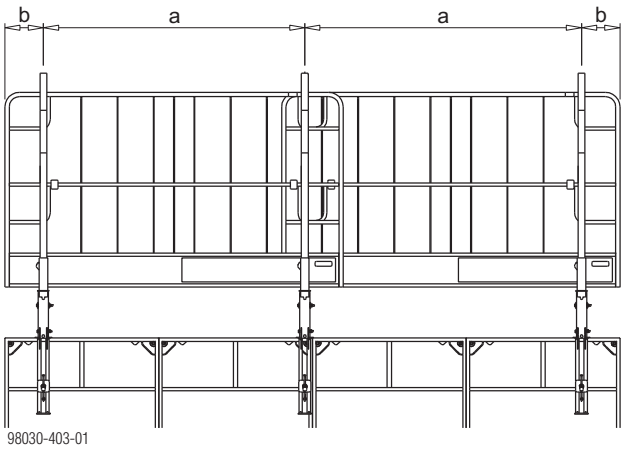


Make sure that the 4-part chain is in the right position:

▪ 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

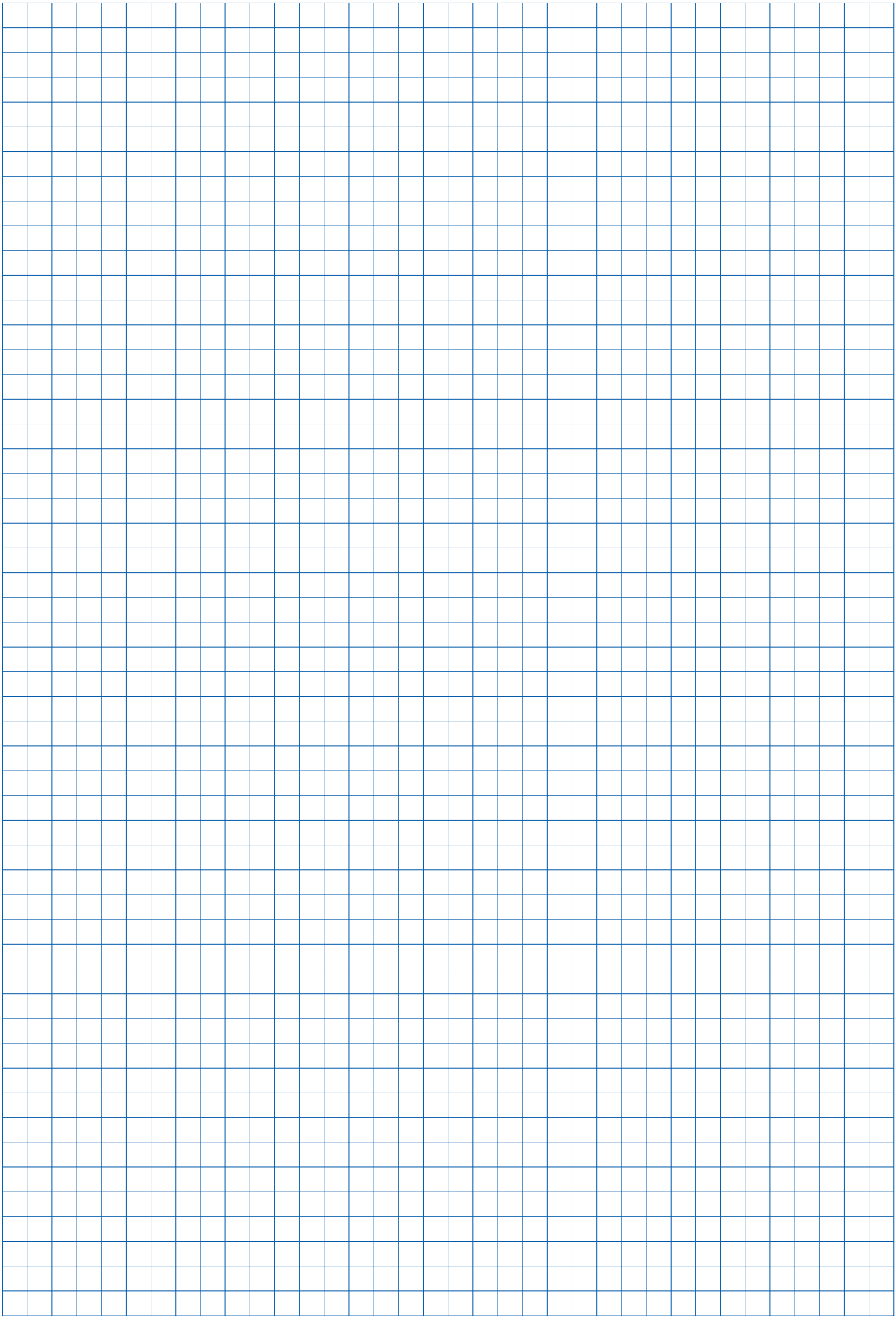
Note:
The wind conditions likely to be encountered in Europe, in accordance with EN 13374, are largely recognised by the dynamic pressure q=0.6 kN/m² (highlighted in the tables).

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**			



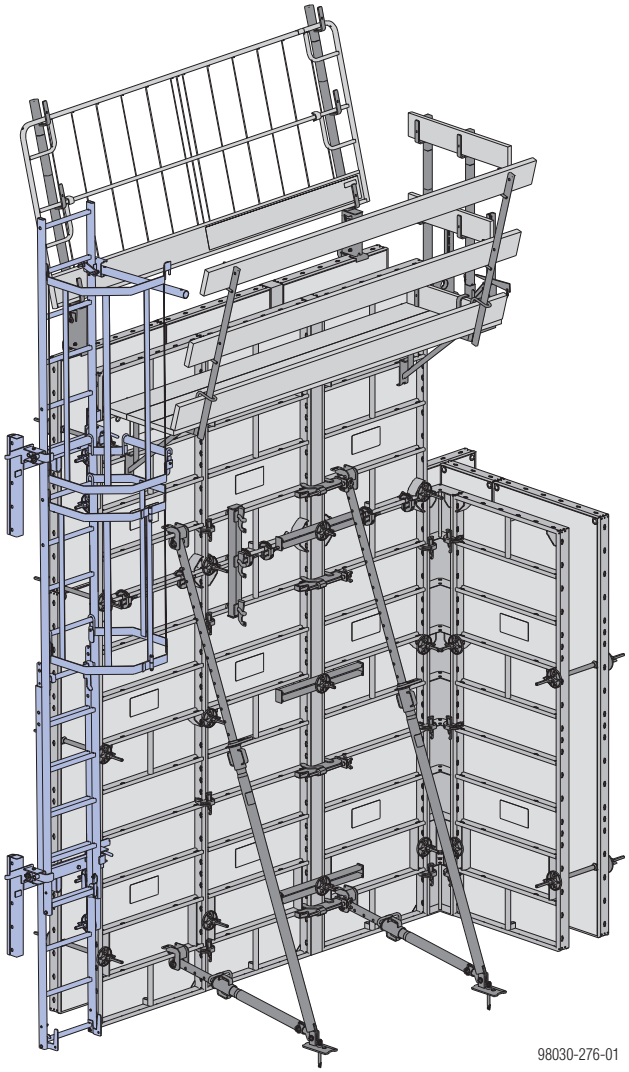
Ladder system

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

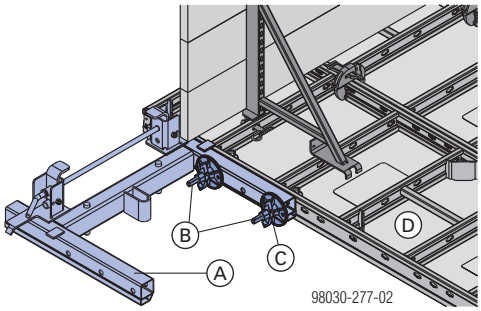
Preparing the formwork

➤ 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").

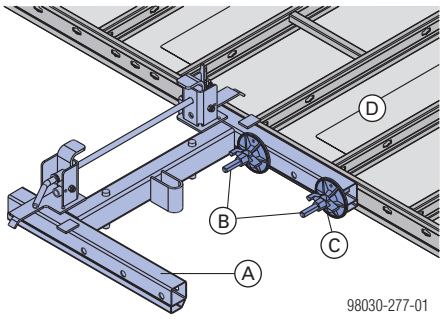
Attaching connectors to the formwork

➤ Place the Connector XS Wall formwork against the frame profile near the top of the formwork.
➤ Attach this "Connector XS for 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 for wall formwork
B	Frami universal fixing bolt 5-12cm
C	Super-plate 15.0
D	Frami Xlife panel

Fixing the ladder

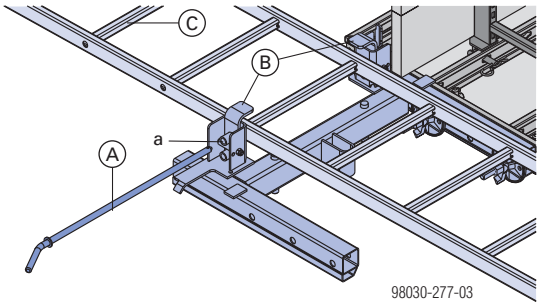
to the top "Connector XS Wall formwork"

➤ 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.



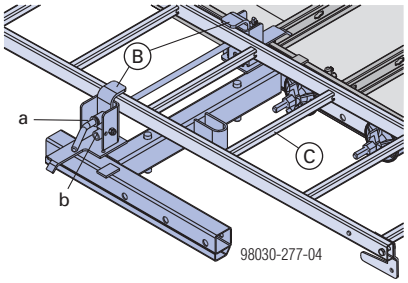
- in the front position (a)

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

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.

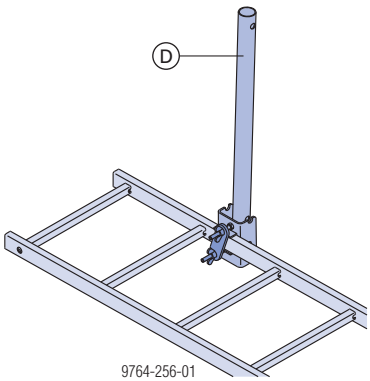
➤ Close the safety hooks, re-insert the push-in bolt and secure it with a linch pin.



– 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

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



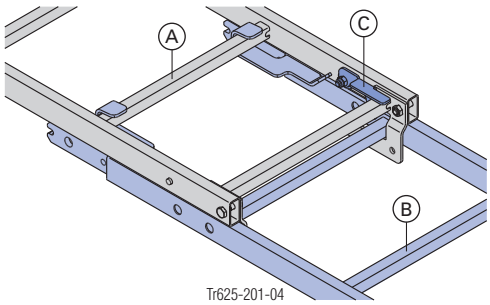
D Securing barrier XS

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

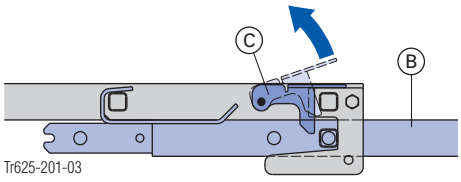
Ladder system XS for heights above 3.60 m

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

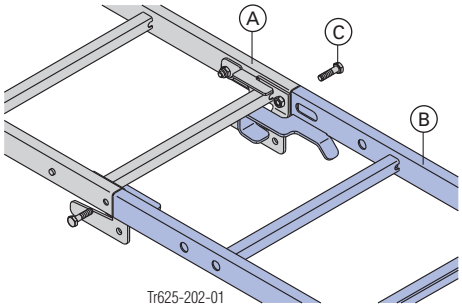


A System ladder XS 4.40m
B Ladder extension XS 2.30m
C Safety latch

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 **very slightly**!



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

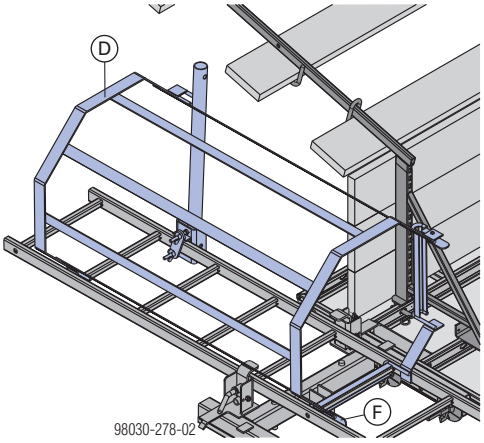
A System ladder XS 4.40m
B Ladder extension XS 2.30m
C Screws, width-across 17 mm

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

NOTICE

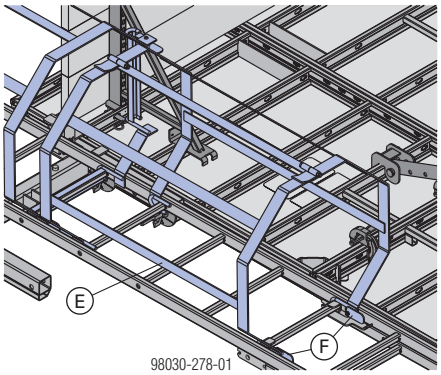
➤ Always observe all relevant safety regulations applying to the use of the Ladder cage XS in the country in which you are operating (e.g. in Germany: BGV D 36).

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



D Ladder cage exit XS
F Safety latch

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

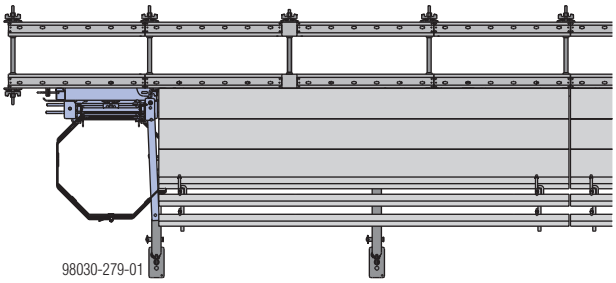


E Ladder cage XS
F Safety latches (lift-out guard)

Fixing in the cross profile

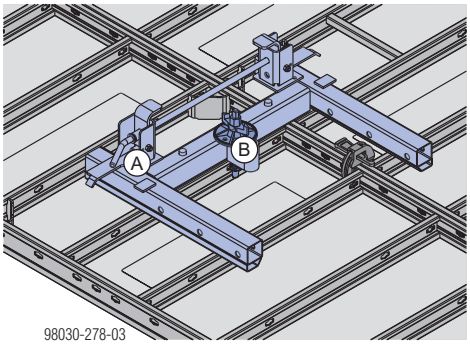
Mounting the Ladder system XS to the cross profile makes it an integral part of the gang-form.

Plan view



How to mount:

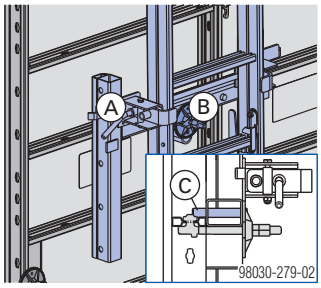
➤ Fix the "Connector XS for wall formwork" to the cross profile with a Frami universal fixing bolt 5-12cm and a Super-plate 15.0.



A Connector XS for 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 for wall formwork" from accidentally sliding off.



A Connector XS for 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

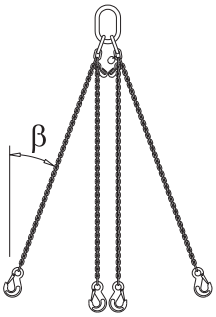
Ladder cage	Formwork height			
	2.70-3.15 m	>3.15-3.90 m	>3.90-5.40 m	>5.40-6.00 m
Ladder cage exit XS [2)]	1	1	1	1
Securing barrier XS [2)]	1	1	1	1
Ladder cage XS 1.00m [2)]	0	1	2	3

[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



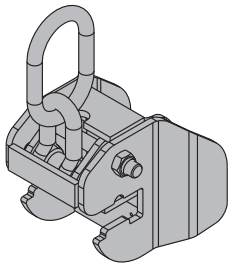
CE

➤ 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

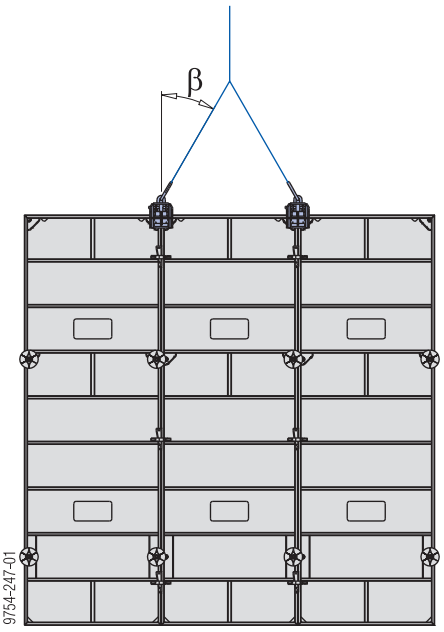
Max. load:
- Spread angle β up to 30°:
  500 kg (1100 lbs) / Frami lifting hook
- Spread angle β up to 7.5°:
  750 kg (1650 lbs) / Frami lifting hook

Follow the directions in the Operating Instructions!

Positioning the lifting hooks

NOTICE
Use 2 lifting hooks for each unit to be lifted!
Exception: Use 1 lifting hook for single panels.

- Always position the Frami lifting hook over the panel joint, to prevent it from sliding from side to side.
  - **Exception:** On single panels incorporated in the horizontal, the lifting hook must be placed over a cross profile.



- Suspend the gang-form symmetrically (centre-of-gravity position).
- Spread angle β ≤ 30° or β ≤ 7.5°!

How to operate the lifting hook

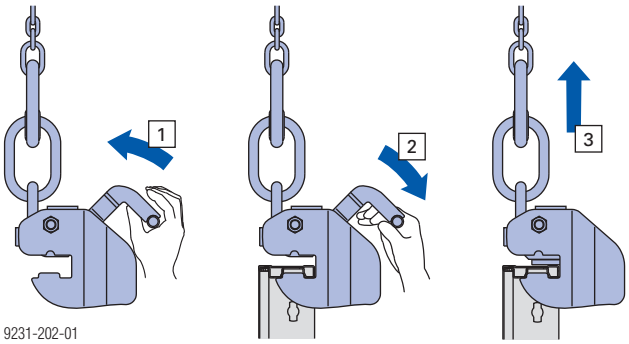
1) Raise the handle (locking lever) as far as it will go.

2) Push the lifting hook onto the frame profile as far as the rear stop, and close the handle (spring-loaded).

Do a sight-check to make sure that there is a secure form-fit between the lifting hook and the frame profile!

The handle must be closed!

3) When the panels are lifted by the crane, a load-dependent locking mechanism is activated.



Striking and repositioning the panels

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

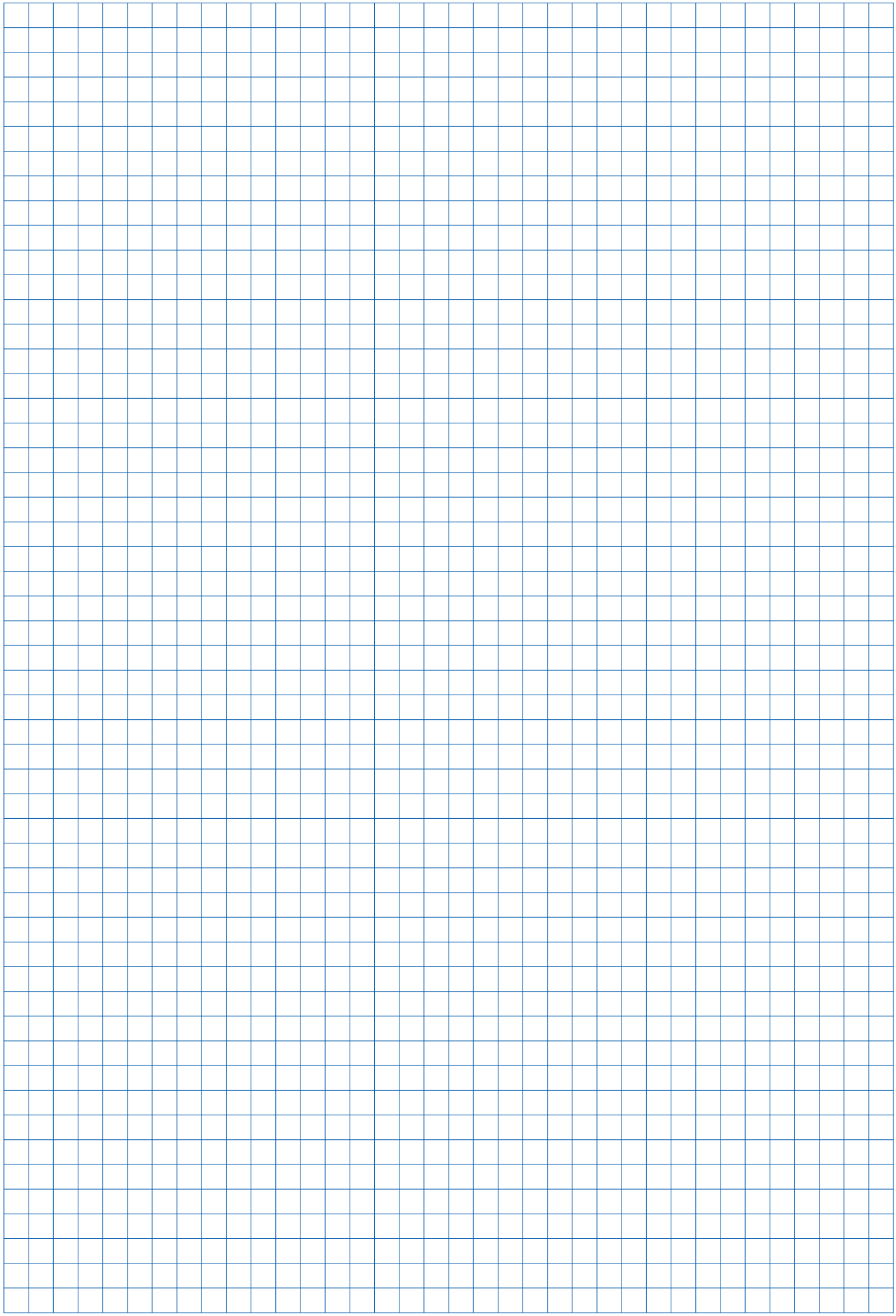
WARNING

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

Risk of crane overload.

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

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



Transporting, stacking and storing

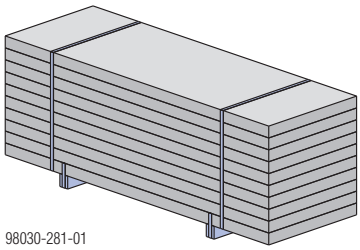
Bundling the panels

1) Place sleepers (W x H approx. 8.0 x 10.0) under the cross-profile.
2) Strap the sleepers (hardwood blocking) and the bottom panel together with strapping tape.

CAUTION

➤ Stack a max. of 10 panels on top of one another (results in a stack height, incl. sleepers, of approx. 100 cm).

3) Strap the whole panel-stack together tightly with strapping tapes.

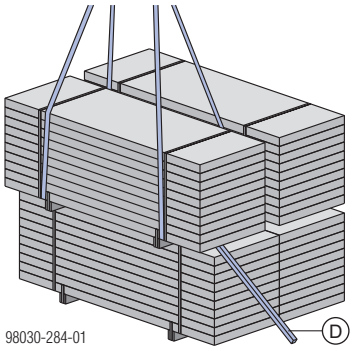


98030-281-01

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**.



98030-284-01

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.

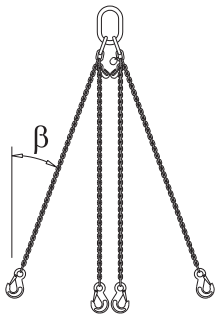
Max. load: 2000 kg

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.

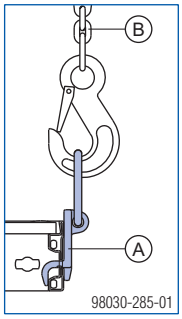
Max. load P_{max}:

	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

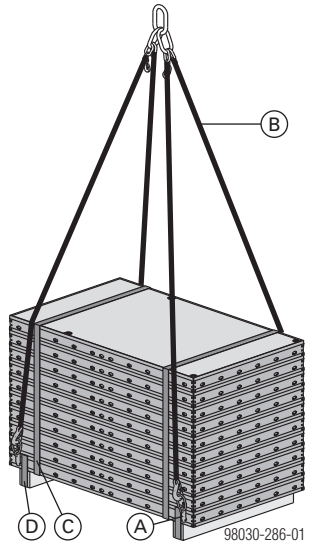
Frami transport hooks manufactured until 2015, with a given load capacity of 250 kg, are also capable of a carrying capacity of 450 kg.

Follow the directions in the Operating Instructions!

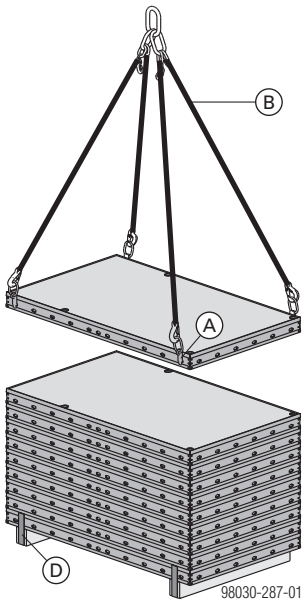
The Frami transport hook plus Doka 4-part chain 3.20m are used for:

- Hoisting bundled stacks of panels
- Lifting panels off the stack
- Handling horizontal (flat) multi-panel gangs

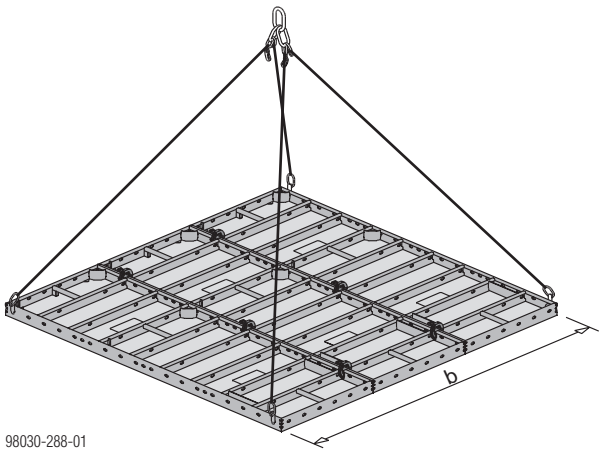
Hoisting bundled stacks of panels



Lifting panels off the stack



Handling horizontal (flat) multi-panel gangs



Shown here on Frami Xlife panels 2.70m.

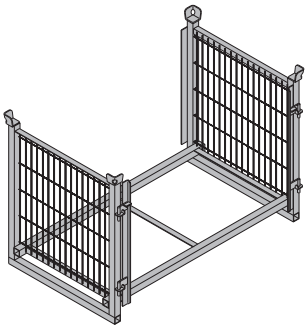
Dimension "b" (width of the gang-form)	Max. n° of panels across the width of the gang-form
Up to 1.80 m	No limitation
Over 1.80 m	**Max. 3 panels**

WARNING
Using the Frami transport hook to **lift either single panels or multi-panel gangs into the upright is forbidden**.

➤ Use the Frami lifting hook to lift panels or gangs into the upright.

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



For holding Frami articles with system heights of 1.20m or 1.50m:
- durable
- stackable

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

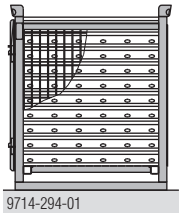
Other features:
- panels can be stored either upright or face-down
- also suitable for inside, outside and hinged corners, closure plates, fitting-timbers (firmly strapped together)

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

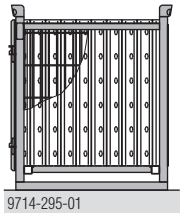
NOTICE
- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- The rating plate must be in place and clearly legible.

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

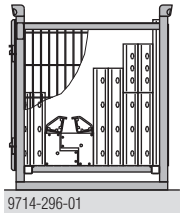
Flat panels



Upright panels

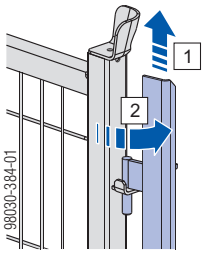


Mixed panels



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 gradient up to 3%	Indoors Floor gradient up to 1%
2	6
It is not allowed to stack empty pallets on top of one another!	

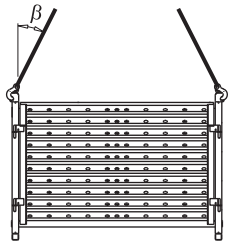
Using Frami pallets as transport devices

Lifting by crane

➤ Before attaching the lifting chain, check that:

Both side hinges must be locked in place

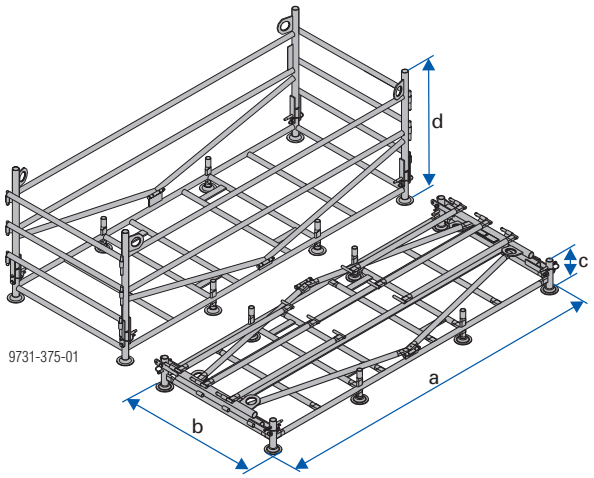
NOTICE
- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread-angle β max. 30°!



Repositioning by forklift truck or pallet stacking truck

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

Alu-Framax pallet



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

A storage unit and transport device for Frami panels 2.70m:

- durable
- stackable – both when filled and when folded closed
- collapsible – do not take up much space

Suitable transport appliances:

- crane
- pallet stacking truck
- forklift truck

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

NOTICE

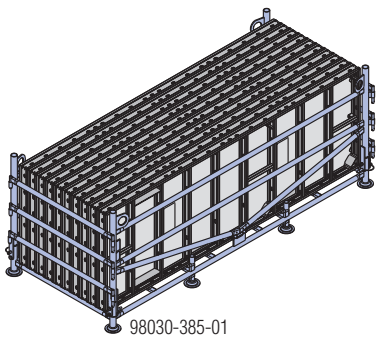
- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

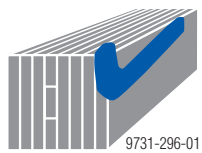
Loading examples

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**!

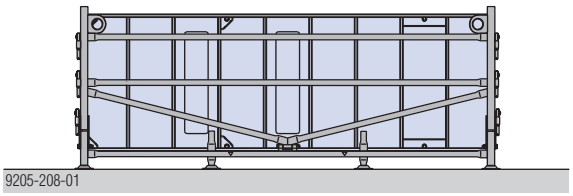




Using Alu-Framax pallets as storage units

Max. n° of units on top of one another

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

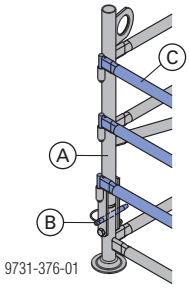
Used for 2.70 m high Frami panels	
	
Panel size	N° of panels
0.90x2.70m	10
0.30x2.70m	30

Using Alu-Framax pallets as transport devices

Lifting by crane

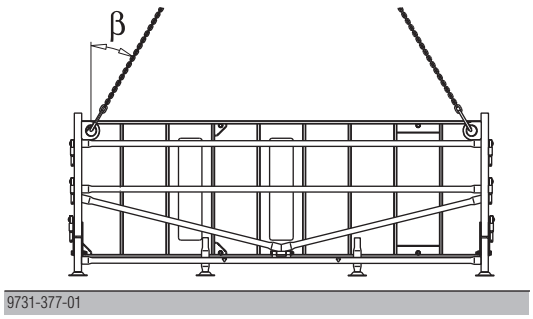
➤ Before attaching the lifting chain, check that:

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



NOTICE

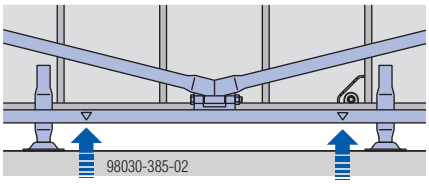
- Multi-trip packaging items may only be lifted one at a time.
- Panels are only allowed to be transported in the pallet if they are stacked in the upright.
- Secure the load in part-loaded pallets!
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread-angle β max. 30°!



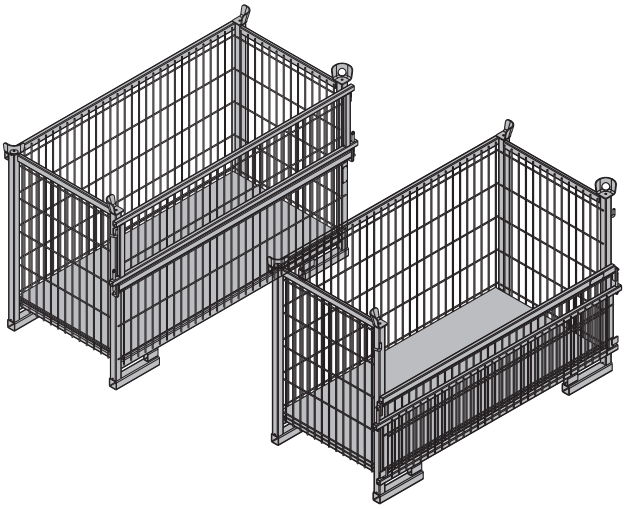
Repositioning by forklift truck or pallet stacking truck

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 devices for small items:

- durable
- stackable

Suitable transport appliances:

- crane
- pallet stacking truck
- forklift truck

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

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

NOTICE

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

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

Max. n° of boxes on top of one another

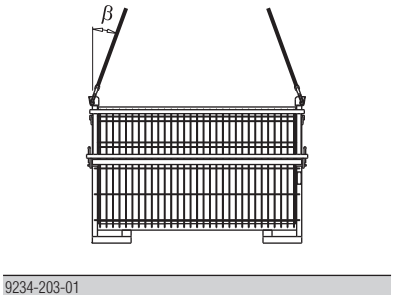
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	5
It is not allowed to stack empty pallets on top of one another!	

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

Lifting by crane

NOTICE

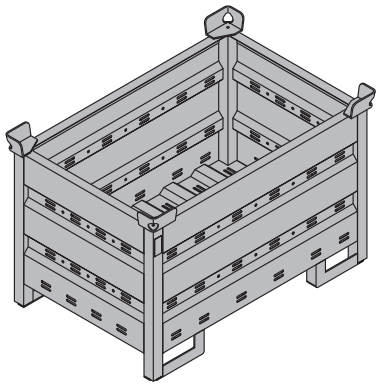
- Multi-trip packaging items may only be lifted one at a time.
- Only lift the boxes when their sidewalls are closed!
- Use a suitable lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Spread-angle β max. 30°!



Repositioning by forklift truck or pallet stacking truck

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

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



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

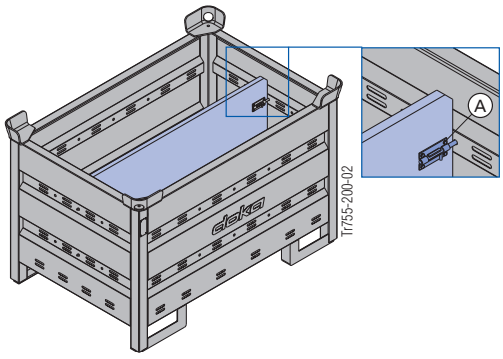
Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

Max. load: 1500 kg (3300 lbs)
Permitted imposed load: 7850 kg (17305 lbs)

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

Multi-trip transport box partition

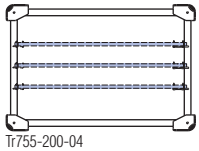
Different items in the Multi-trip transport box can be kept separate with the Multi-trip transport box partitions 1.20m or 0.80m.

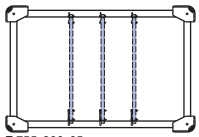


A Slide-bolt for fixing the partition

Possible ways of dividing the box

Multi-trip transport box partition	Lengthways	Crossways
1.20m	max. 3 partitions	-
0.80m	-	max. 3 partitions


Tr755-200-04


Tr755-200-05

Using Doka multi-trip transport boxes as storage units

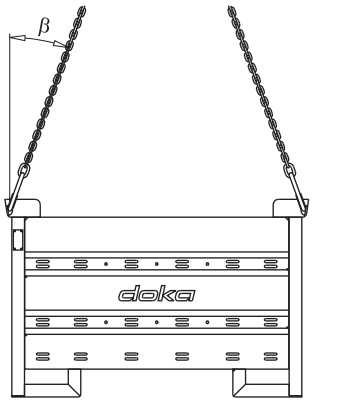
Max. n° of boxes on top of one another

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

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

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°!

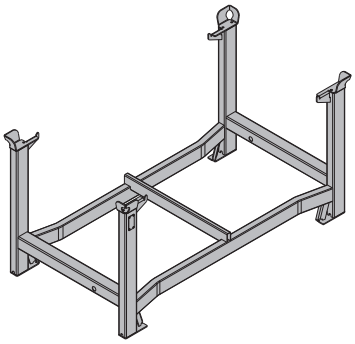


9206-202-01

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:
- durable
- stackable

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

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

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

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

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

Note:

How to use with bolt-on castor set:

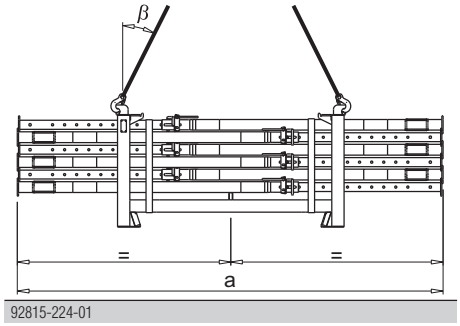
Always apply the fixing brake when the container is ‘parked’.

When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

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 lifting chain (e.g. Doka 4-part chain 3.20m). Do not exceed the permitted load-bearing capacity.
- Load the items centrically.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.
- Spread-angle β max. 30°!

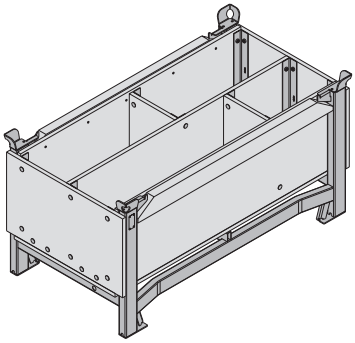


	a
Doka stacking pallet 1.55x0.85m	max. 4.0 m
Doka stacking pallet 1.20x0.80m	max. 3.0 m

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 devices for small items:
- durable
- stackable

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

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

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

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

Doka accessory boxes as storage units

Max. n° of boxes on top of one another

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

Note:

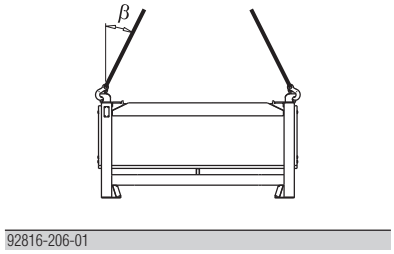
How to use with bolt-on castor set:
Always apply the fixing brake when the container is "parked".

When Doka accessory boxes are stacked, the bottom box must NOT be one with a bolt-on castor set mounted to it.

Doka accessory box as transport devices

Lifting by crane

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°!



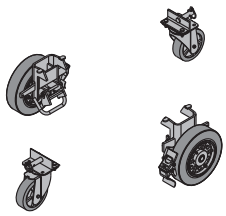
Repositioning by forklift truck or pallet stacking truck

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

Bolt-on castor set B

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

Suitable for drive-through access openings > 90 cm.



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

Follow the directions in the Operating Instructions!

General remarks

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

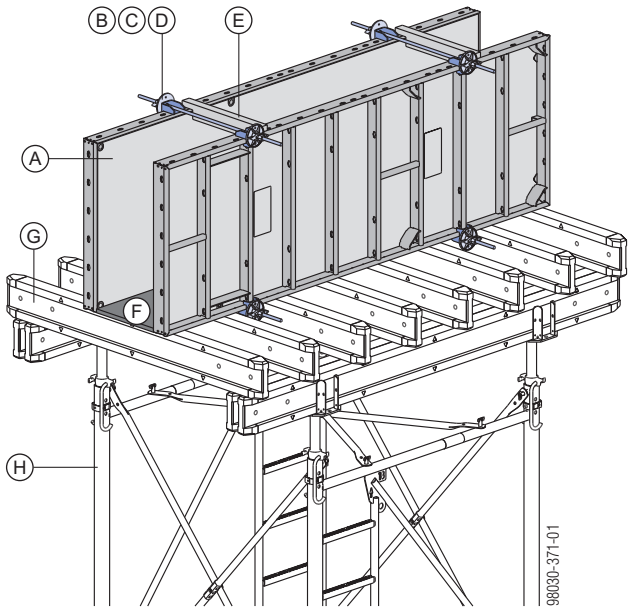
Required numbers of Frami tie-holder brackets:

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)

Formwork planning with Tipos-Doka

Tipos-Doka helps you to form even more efficiently

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

Easy to use, fast and accurate results

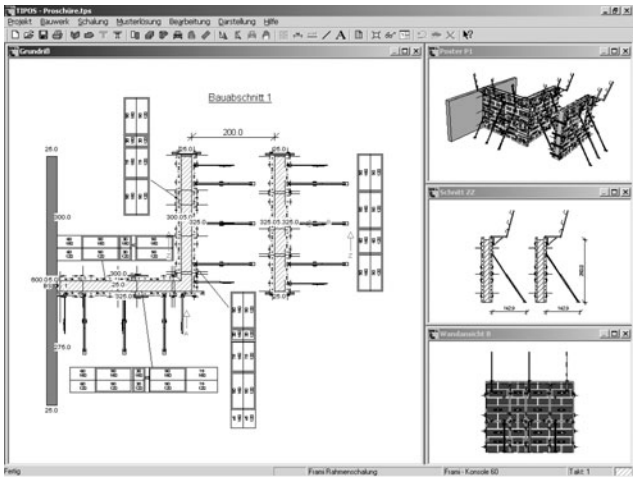
The easy-to-use interface makes for very fast working. From when you input your layout (with the "Schal-Igel"® on-screen assistant), all the way through to when you manually put the finishing touches to the formwork solution the program gives you. All this saves time - yours.

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

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

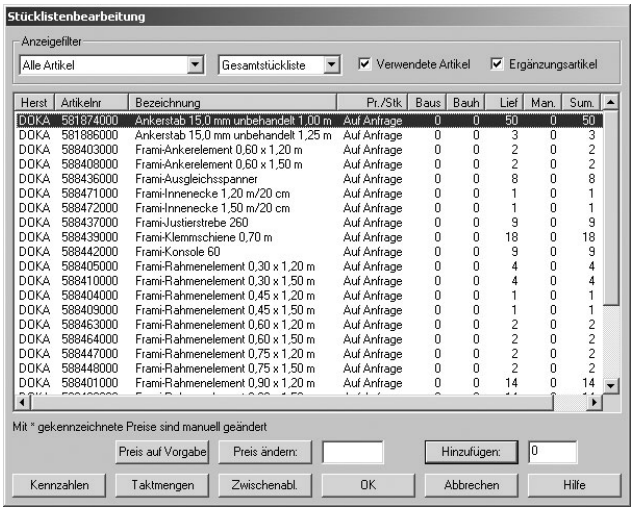
Among other things, Tipos-Doka plans the following with Frami Xlife:

- Distribution of panels
- Any vertically stacked configurations that are needed
- Closures and accessories
- Pouring platforms, safety railings etc.



Drawings of formwork and platforms really can be this detailed! Both for the layout and for spatial representations, Tipos-Doka sets an impressive new standard of visual presentation.

Always the right quantities of formwork and accessories



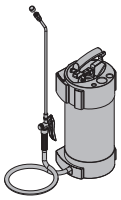
You can import the automatically generated piece-lists into many other programs for further processing.

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

Cleaning and care of your equipment

Release agents

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



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

NOTICE

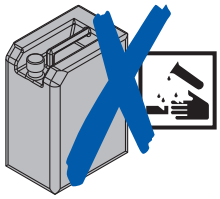
- Before every pour:
  - Apply release agent to the formwork sheet and the end faces **extremely thinly**, **evenly** and **in a continuous layer**.
- Make sure there are no drips of release-agent running down the formwork sheet.
- Applying too much release agent will spoil the concrete finish.

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

Cleaning

NOTICE

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

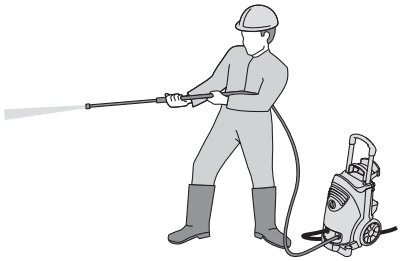


Cleaning high formwork:
Provide a service tower at a suitable cleaning location.

- Wheel-around scaffold DF
  (up to a formwork height of 3.90 m)
- Working scaffold Modul
  (up to a formwork height of 6,70 m)

Cleaning equipment

High-pressure spray cleaner

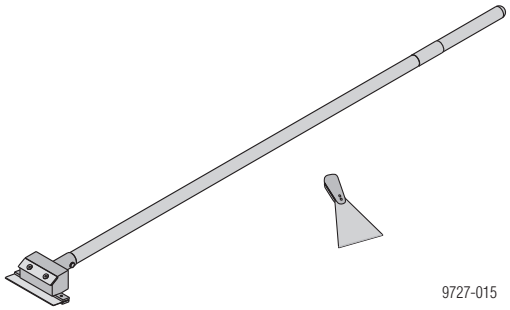


NOTICE

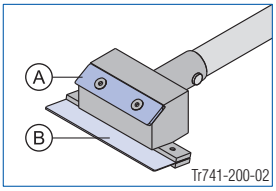
- Appliance pressure rating: 200 to max. 300 bar
- Keep the water-jet the correct distance from the formwork, and move it at the right speed:
  - The higher the pressure, the further away from the formwork you must keep the jet and the faster you must move it across the surface.
- Do not aim the jet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

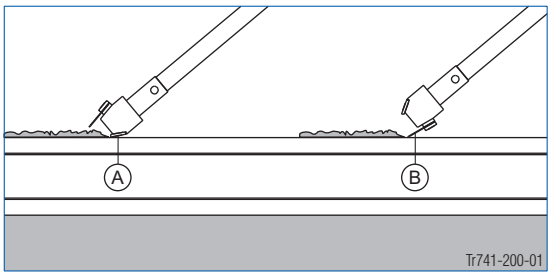
Concrete scraper

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



Functional description:

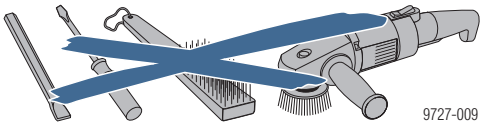




A Blade for dealing with heavy soiling
B Blade for dealing with slight soiling

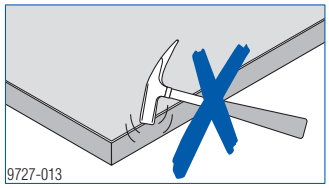
NOTICE

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

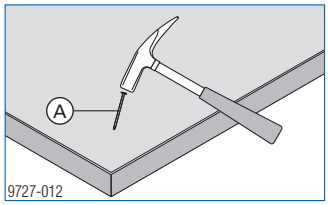


Care

- No hammer-blows to the frame profiles

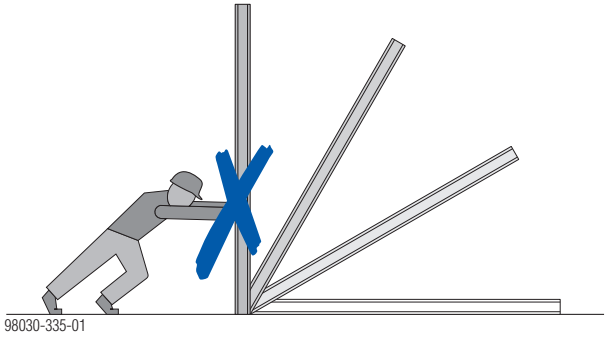


- Do not use nails on the formwork that are longer than 60 mm

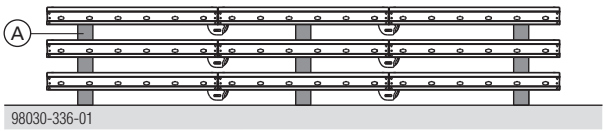


A max. l=60 mm

- Never push over panels or allow them to fall



- Only stack panel gangs on top of one another with timber battens **(A)** between each layer.

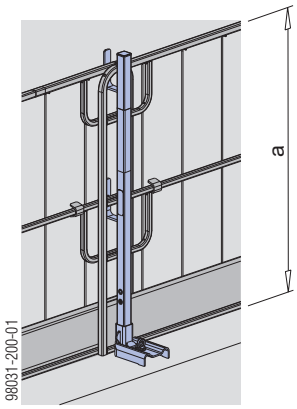


This prevents the formwork sheets from being damaged by the connector components.

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

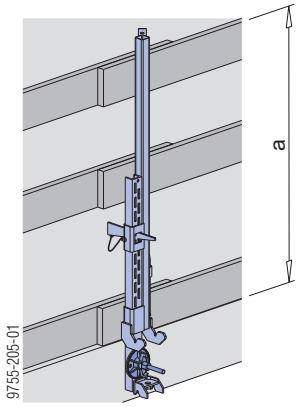


a ... > 1.00 m

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

Handrail clamp T

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

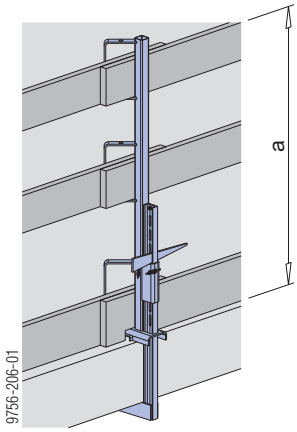


a ... > 1.00 m

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

Handrail clamp S

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

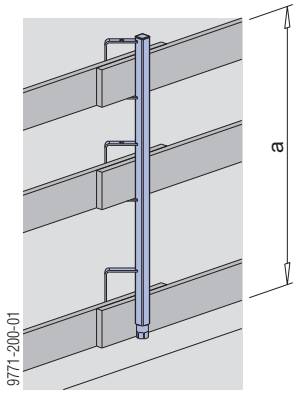


a ... > 1.00 m

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

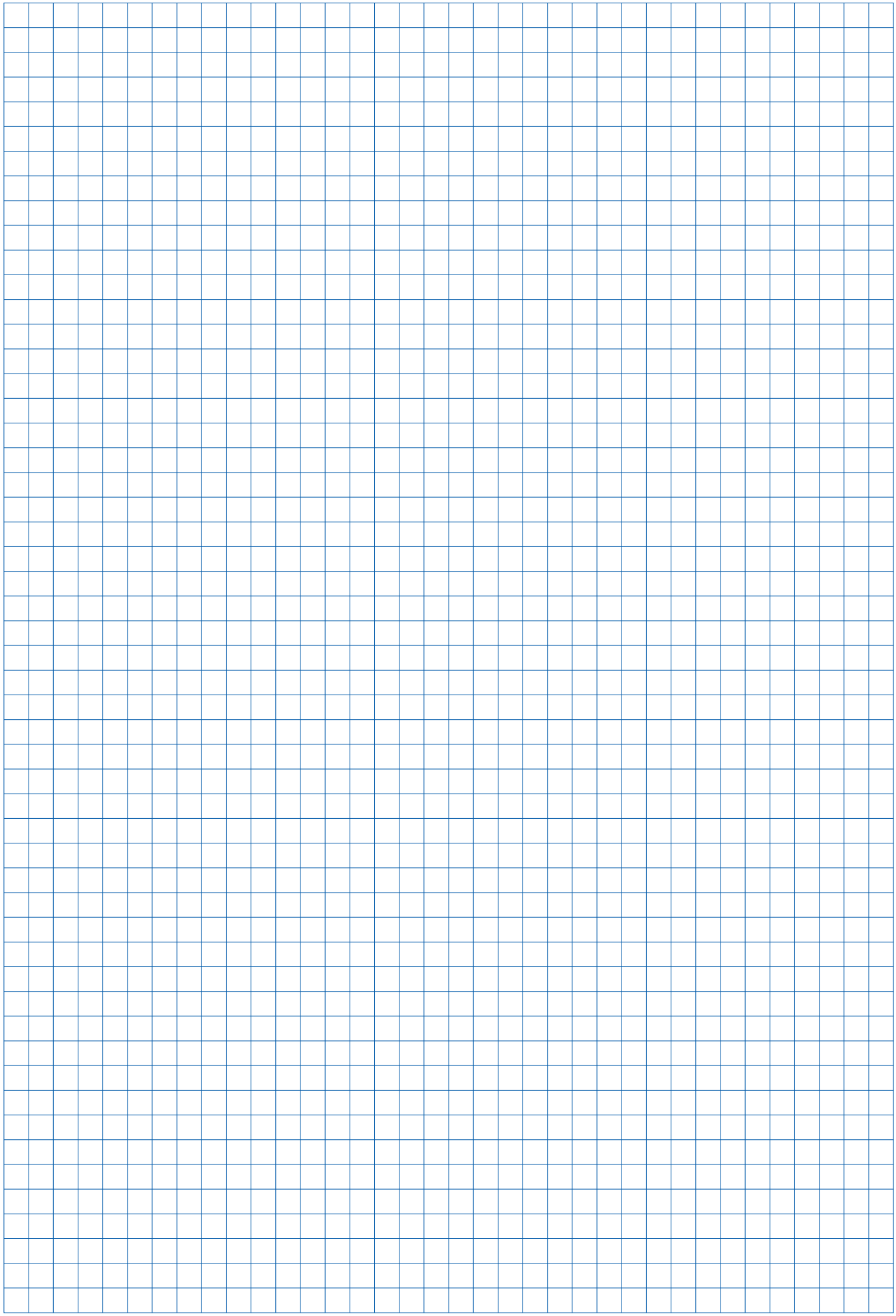
Handrail post 1.10m

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



a ... > 1.00 m

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



	[kg]	Article n°
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	**40.3**	**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 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

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

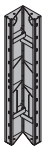
Galvanised

	[kg]	Article n°
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 I galv. 1.20m	**34.1**	**588425500**
Frami hinged inside corner I galv. 1.50m	**40.8**	**588426500**
Frami-Scharnierecke I verzinkt		
Galvanised		

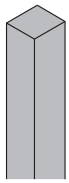
Frami hinged inside corner I 1.20m	**33.5**	**588425000**
Frami hinged inside corner I 1.50m	**40.0**	**588426000**
Frami-Scharnierecke I		
Powder-coated blue		



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		

	[kg]	Article n°
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		



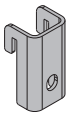
Frami plywood support 27mm	**2.0**	**588473000**
Frami plywood support 21mm	**2.1**	**588474000**
Frami plywood support 18mm	**2.2**	**588499000**
Frami-Schalhautwinkel		
Galvanised		
Height: 56 cm		

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

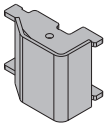
Framax stripping spindle I	**3.2**	**588618000**
Framax-Ausschalspindel I		
Galvanised		
Height: 25 cm		

Framax stripping spindle I with ratchet	**5.5**	**588653000**
Framax-Ausschalspindel I mit Ratsche		
Galvanised		
Height: 24.8 cm		

Frami tie-adapter for stripping corner I	**0.47**	**588492000**
Frami-Ankeradapter für Ausschalecke I		
Galvanised		
Height: 11 cm		

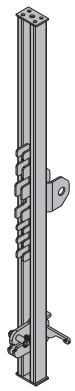
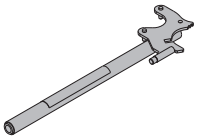
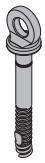
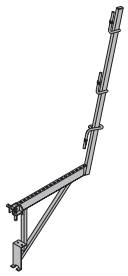
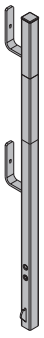


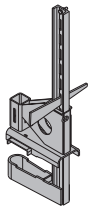
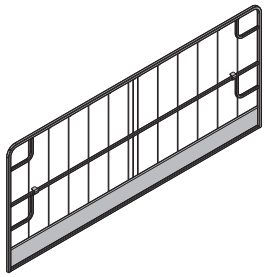
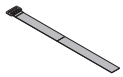
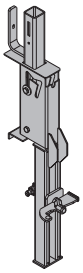
Frami profile adapter for stripping corner I	**0.60**	**588491000**
Frami-Profiladapter für Ausschalecke I		
Galvanised		
Height: 8 cm		



	[kg]	Article n°
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**
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**

	[kg]	Article n°
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"! CE	**7.5**	**588438000**
Plumbing strut 260 IB Justierstütze 260 IB Galvanised Length: 146.8 - 256.7 cm	**12.8**	**588437500**
Panel strut 340 IB Elementstütze 340 IB consisting of: (A) **Plumbing strut 340 IB** Galvanised Length: 190.8 - 341.8 cm (B) **Adjusting strut 120 IB** Galvanised Length: 81.5 - 130.6 cm Galvanised Delivery condition: folded closed	**24.3** **16.7** **7.6**	**580365000** **588696000** **588248500**
Strut head EB Strebenkopf EB Galvanised Width: 9 cm Height: 14 cm	**1.4**	**588945000**

	[kg]	Article n°
Frami connection profile EB Frami-Anschlussprofil EB Painted blue Height: 125 cm 	**10.1**	**588462000**
Universal dismantling tool Universal-Lösewerkzeug Galvanised Length: 75.5 cm 	**3.7**	**582768000**
Doka express anchor 16x125mm Doka-Expressanker 16x125mm Galvanised Length: 18 cm Follow the directions in the "Fitting instructions"! 	**0.31**	**588631000**
Doka coil 16mm Doka-Coil 16mm Galvanised Diameter: 1.6 cm 	**0.009**	**588633000**
Frami bracket 60 Frami-Konsole 60 Galvanised Length: 98 cm Height: 157 cm 	**7.7**	**588442000**
Handrail post XP 1.20m Geländersteher XP 1,20m Galvanised Height: 118 cm 	**4.1**	**586460000**

	[kg]	Article n°
Toeboard holder XP 1.20m Fußwehrhalter XP 1,20m Galvanised Height: 21 cm 	**0.64**	**586461000**
Railing clamp XP 40cm Geländerzwinge XP 40cm Galvanised Height: 73 cm 	**7.7**	**586456000**
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**
Velcro fastener 30x380mm Klettverschluss 30x380mm Yellow 	**0.02**	**586470000**
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**

	[kg]	Article n°
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**
Framax triangular ledge 2.70m Framax-Dreikantleiste 2,70m	**0.38**	**588170000**
Frami frontal triangular ledge 2.70m	**1.5**	**588496000**
Frami frontal triangular ledge 3.00m Frami-Stirndreikantleiste Grey	**1.7**	**588497000**
Frami tie-holder bracket Frami-Ankerhaltewinkel Galvanised	**0.58**	**588453000**

	[kg]	Article n°
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**
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: folded closed	**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

	[kg]	Article n°
Connector XS Wall formwork Anschluss XS Wandschalung Galvanised Width: 89 cm Height: 63 cm	**20.8**	**588662000**
System ladder XS 4.40m System-Leiter XS 4,40m Galvanised	**33.2**	**588640000**
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

Tie rod 15.0mm galvanised 0.50m	**0.72**	**581821000**
Tie rod 15.0mm galvanised 0.75m	**1.1**	**581822000**
Tie rod 15.0mm galvanised 1.00m	**1.4**	**581823000**
Tie rod 15.0mm galvanised 1.25m	**1.8**	**581826000**
Tie rod 15.0mm galvanised 1.50m	**2.2**	**581827000**
Tie rod 15.0mm galvanised 1.75m	**2.5**	**581828000**
Tie rod 15.0mm galvanised 2.00m	**2.9**	**581829000**
Tie rod 15.0mm galvanised 2.50m	**3.6**	**581852000**
Tie rod 15.0mm galvanised .....m	**1.4**	**581824000**
Tie rod 15.0mm non-treated 0.50m	**0.73**	**581870000**
Tie rod 15.0mm non-treated 0.75m	**1.1**	**581871000**
Tie rod 15.0mm non-treated 1.00m	**1.4**	**581874000**
Tie rod 15.0mm non-treated 1.25m	**1.8**	**581886000**
Tie rod 15.0mm non-treated 1.50m	**2.1**	**581876000**
Tie rod 15.0mm non-treated 1.75m	**2.5**	**581887000**
Tie rod 15.0mm non-treated 2.00m	**2.9**	**581875000**
Tie rod 15.0mm non-treated 2.50m	**3.6**	**581877000**
Tie rod 15.0mm non-treated 3.00m	**4.3**	**581878000**
Tie rod 15.0mm non-treated 3.50m	**5.0**	**581888000**
Tie rod 15.0mm non-treated 4.00m	**5.7**	**581879000**
Tie rod 15.0mm non-treated 5.00m	**7.2**	**581880000**
Tie rod 15.0mm non-treated 6.00m	**8.6**	**581881000**
Tie rod 15.0mm non-treated 7.50m	**10.7**	**581882000**
Tie rod 15.0mm non-treated .....m	**1.4**	**581873000**

Ankerstab 15,0mm

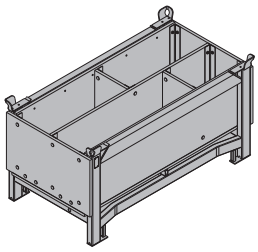
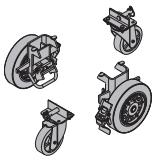
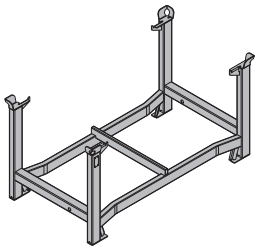
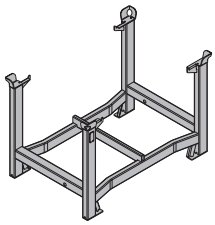
DIN 18216

Super plate 15.0 Superplatte 15,0 Galvanised Height: 6 cm Diameter: 12 cm Width-across: 27 mm	**1.1**	**581966000**
Wing nut 15.0 Flügelmutter 15,0 Galvanised Length: 10 cm Height: 5 cm Width-across: 27 mm	**0.31**	**581961000**
Angle anchor plate 12/18 Winkelplatte 12/18 Galvanised	**1.5**	**581934000**
Hexagon nut 15.0 Sechskantmutter 15,0 Galvanised Length: 5 cm Width-across: 30 mm	**0.23**	**581964000**

	[kg]	Article n°
Frami pressure plate 8/9 Frami-Druckplatte 8/9 Galvanised	**0.55**	**588466000**
Distance piece 20cm **Distance piece 25cm** **Distance piece 30cm** Distanzhalter PE Grey Blue	**0.04** **0.05** **0.06**	**581907000** **581908000** **581909000**
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

	[kg]	Article n°
Frami pallet 1.20m Frami-Palette 1,20m Galvanised Length: 138 cm Width: 100 cm Height: 114 cm	**68.0**	**588478000**
Frami pallet 1.50m Frami-Palette 1,50m Galvanised Length: 168 cm Width: 100 cm Height: 114 cm	**74.0**	**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**

	[kg]	Article n°
Doka accessory box Doka-Kleinteilebox Timber parts varnished yellow Steel parts galvanised Length: 154 cm Width: 83 cm Height: 77 cm 	**106.4**	**583010000**
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**

[kg]	Article n°

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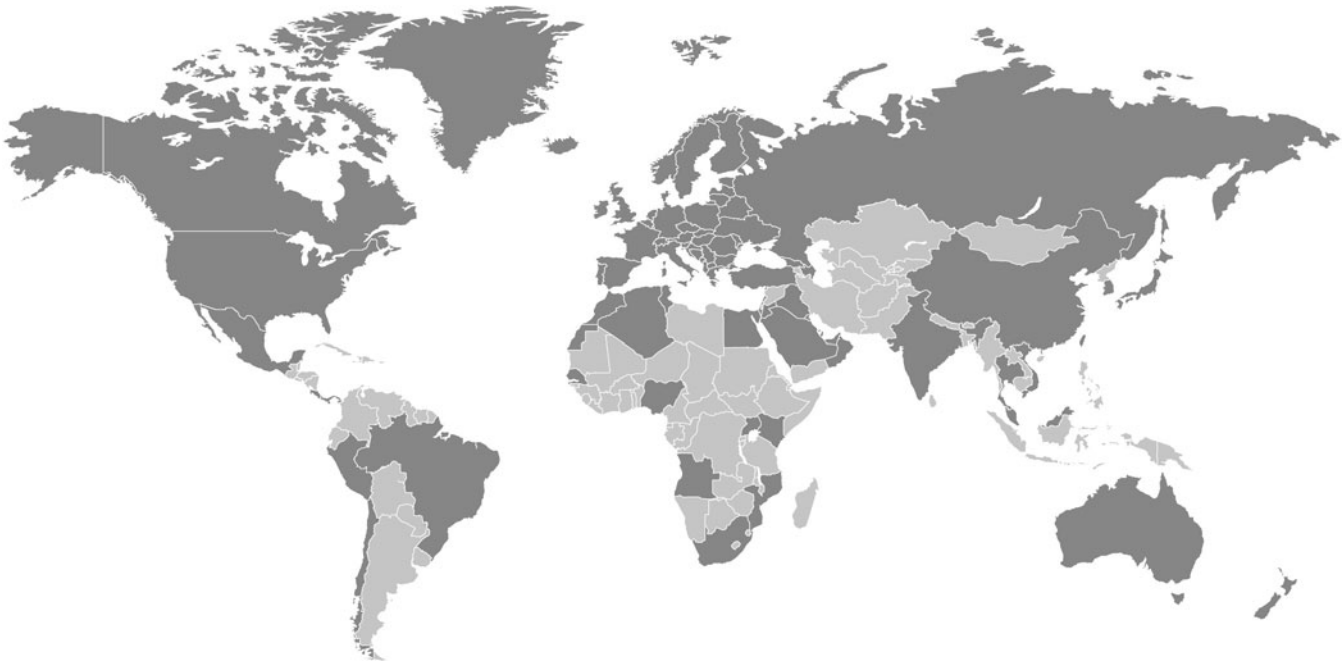

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